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Vincent's Infection—A Wartime Disease

Preliminary Considerations on the Epidemiology of Ulcerative Gingivostomatitis *

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FOLLOWING the last war the colloquial reference to Vincent's infection as "trench mouth" developed a tendency in the minds of many to associate it particularly with World War I, but the history of ulcerative stomatitis may be followed back with relative certainty to the end of the 18th century. According to Bergeron [1, 2] the report of Desgenettes—a view concurred in by Hirsch [3]—citing the outbreak occurring in 1793 and 1794 in the French Army during the Italian campaign, constitutes the first article dealing specifically with this condition. Prior to that time it is Hirsch's opinion that whatever had been written of the disease is more or less hidden from view, being confused under such general headings as malignant aphthae, noma, "stomacace," or other broad designations used by older writers covering various diseases of the mucous membrane of the mouth. A recent review by Hirshfield, et al.[4] credits John Hunter with clearly differentiating ulcerative stomatitis from periodontoclasia and the oral manifestations of scurvy as early as 1778.

For those interested in 19th century literature on the epidemiology of ulcerative stomatitis, recourse may be had to the work of Bergeron [1, 2] and Hirsch.[3]

RECOGNITION OF THE DISEASE (DIAGNOSIS)

Ulcerative gingivostomatitis is known by a number of synonyms: ulcerative stomatitis, necrotic gingivitis, ulceromembranous gingivitis, phagedenic gingivitis, Vincent's infection, "trench mouth," and "putrid mouth" (Mundfäule).

The characteristic syndrome of ulcerative gingivostomatitis is: pain, necrosis,

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psuedomembrane formation, salivation, and a characteristic fetid odor. The onset is rapid, pain being often the only prodromal symptom. The interdental papillae become acutely inflamed, stand away from the teeth, bleed easily on the slightest touch, and are exquisitely painful. Necrosis occurs, beginnihg with the tip of the interdental papillae, with subsequent development of a characteristic greyish-white pseudomembrane which is easily removed, leaving a raw, profusely bleeding surface. The characteristic odor is a diagnostic point of importance.

This condition may be limited to the interdental papillae of a few adjoining teeth or become generalized, spreading along the festoon of the labial, buccal, and occasionally lingual gingivae, and may at times involve all of the interdental papillae. The anterior (incisor-cuspid) region is the most common site of origin. While ulcerative stomatitis commonly confines itself to the gingiva, it may at times extend to the other parts of the oral mucosa. These secondary lesions are largely confined to the mucous membrane of the cheeks and lips, originating at some area where the mucous membrane is in direct contact with the ulcerated gingiva when the mouth is closed.

Differential diagnosis should exclude: marginal gingivitis, hypertrophic gingivitis, suppurative periodontitis, forms of gingivitis associated with metallic poisons, and certain systemic diseases such as scurvy, pellagra, blood dyscrasias, and the mucous patches of syphilis.

Although the fuso-spirochetal organisms are found to be the predominating bacterial types in this condition, microscopic demonstration of these organisms should not be interpreted independently of clinical findings. Diagnosis rests basically on the clinical syndrome: pain, fetor, pseudomembrane formation and necrosis. In the absence of this symptom-complex, a positive bacteriological diagnosis serves little purpose.

EPIDEMIOLOGIC CONSIDERATIONS

In dental epidemiology an example of a condition permitting the quantitative measurement of the causative factors and the rate of change in the consequent effects as these factors change is endemic dental fluorosis. In the short space of thirty years its basic epidemiology was written, the etiological agent determined, and its complete prevention under mass control conditions demonstrated. But few problems in stomatology possess the inherent requisites for such objective measurement of its factors as does this simple affection of the dental enamel.

In sharp contrast stands ulcerative gingivostomatitis. After a century and a half and much accumulated experience most of its basic epidemiology is still enshrouded in almost as much uncertainty as in the days of Bergeron and Hirsch.

Consider for example the all-important question of communicability. In 1886 after commenting that the etiology of ulcerative stomatitis among bodies of troops was for the present unsolved, Hirsch [3] wrote:

> The opinion that putrid mouth is *contagious* or communicable which was expressed by Payen, Léonard, Brée, Bergeron, and Guépratte (and formerly adhered to by me) is not borne out by the experience of Cafford, Colin, Perrier, Laveran, Mourson, Catelan, and Maget, the two last named more especially having made experiments on themselves which produced no effect.

But for the names, this statement has a familiar ring. One would have little difficulty in substituting for these 19th century workers the names of present-day writers. The number of proponents of the communicability assumption and those who reject this supposition would show little change in this division of opinion. The critical

analysis of the existing evidence made a few years ago by Rosebury [5] in a paper entitled: "Is Vincent's Infection a Communicable Disease?" provides a fitting sequel to the quoted passage from Hirsch of sixty years ago.

Until a few consistent and indisputable facts are clearly demonstrated, an effort to outline the epidemiology of ulcerative gingivostomatitis must proceed with extreme caution. Either we have failed to perceive the significance of what little we know of this syndrome or do not know what is significant in the discordant contradictory literature of the present. The need of a long term searching epidemiological inquiry is so obvious that further comment would be purposeless.

An opportunity recently presented itself to study the dental admission records at the 33 chair Dental Clinic of the U. S. Public Health Service hospital, Sheepshead Bay, New York. This dental clinic serves the officers and men of the U. S. Coast Guard Training Station, Manhattan Beach, and the U. S. Maritime Service Training Station, Sheepshead Bay. While these two populations are located on two contiguous reservations and the personnel of each is either in training for or has experienced sea service, the two groups are completely separate administratively. The Coast Guard, in time of war, is a part of the U. S. Navy; the Maritime Service is concerned with training of personnel for the operation of the merchant marine. Approximately 75,000 men went through these two stations in 1943.

All admissions to the Dental Clinic during 1943 passed through the Clinic's examination unit, two dental officers ordinarily being assigned to this unit for a two months' tour of duty. Beginning May 1, 1943, one dental officer was assigned to the Coast Guard induction center and one dental officer to the Maritime Service induction center for cursory dental inspection of all men arriving at each station. This system has continued without interruption. All cases tentatively diagnosed as Vincent's infection, questionable Vincent's infection, or gingivitis other than Vincent's and which in the opinion of the inspecting dental officer required immediate clinical treatment * were sent from the induction center to the Clinic's examination unit for a complete dental examination. Other admissions for gingivitis, all forms, were those sent direct to the Clinic's examination unit following the organization's daily sick call. Personnel diagnosed as having one or the other of the gingival disturbances listed were sent to the Clinic's Periodontia Department for treatment.

All dental examination schedules for 1943 were inspected † critically by one of us (D.E.S., Jr.) and the records of all 1943 new admissions for ulcerative gingivostomatitis (Vincent's infection) questionable Vincent's infection, or gingivitis (other than Vincent's infection) were transferred to punch cards for subsequent analysis. For the calendar year 1943, the records thus transferred totaled 3,385. During the first quarter of 1944, new admissions for Vincent's infection totalled 404. These, too, were transferred to punch cards for use in computing the annual rate for the month for this period.

The data which will be presented later is based upon diagnoses made by U. S. Public Health Service dental

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* In all probability the amount of non-Vincent's gingivitis reported in this paper considerably understates the actual prevalence in these two commands. The prevalence of gingivitis (all types) would naturally include not only those admitted to the Clinic for treatment but likewise those milder cases not sent to the Clinic for treatment on initial inspection or not reporting on subsequent sick calls because of the minor nature of the gingival disturbance.

The over-all prevalence of gingivitis could only be determined by a random sampling of each command, but it was not felt that such interference with training programs was justified.

† Study began January, 1944.

officers. In a broad statistical analysis of morbidity data from clinic or hospital records there is always a considerable factor of uncertainty difficult to appraise. The criterion of diagnosis of Vincent's infection doubtless varies among different dental officers; as is well known the nosology of gingivitis is highly imperfect.

These data, therefore, are largely of the nature of an "epidemiological case report" indicating the frequency of these various types of gingivitides in these particular populations during the period of time specified according to the diagnostic criteria of the U. S. Public Health Service dental officers admitting the patient to the clinic.

AGE DISTRIBUTION

The age distribution of the personnel admitted during 1943 for one or the other of the previously mentioned types of gingivitis was determined for Coast Guard, Maritime Training Service, and others (USPHS, USN, and dependents). During 1943 there were admitted to the Clinic 1,578 cases of Vincent's infection, 311 cases of questionable Vincent's infection, and 1,496 individuals with gingivitis (other than Vincent's). These data distributed according to age are shown in Table 1.

DISTRIBUTION IN TIME

There have been a number of references in the literature to seasonal distribution in the incidence of Vincent's infection. However, these distributions seemingly follow no consistent pattern. Speaking of seasonal distribution, Frost [6] states:

> The seasonal fluctuations in rates of prevalence which are characteristic in many diseases can usually be explained, if at all, only in the light of fairly definite knowledge of other associated epidemiological features; hence, considered by themselves, these fluctuations must be interpreted most cautiously.

Until certain basic facts in the epidemiology of Vincent's infection have been made clear it would seem prudent to heed this cautionary admonition with respect to interpreting data of this nature.

In attempting to interpret fluctuations in monthly morbidity rates in a military population the problem is further complicated by the "flow factor" or the amount and type of movement of the personnel through the organization or camp. For instance, a

TABLE 1

Age Distribution of 3,385 Cases Admitted to the USPHS Dental Clinic, Sheepshead Bay (N. Y.), During the Calendar Year 1943 for Ulcerative Gingivostomatitis (Vincent's Infection), Questionable Vincent's Infection, or Gingivitis Other Than Vincent's Infection According to Branch of Service

Age	Ulcerative Gingivostomatitis (Vincent's Infection) (a)				Questionable (Vincent's Infection) (b)				Gingivitis (Other than Vincent's) (c)				All Conditions (a+b+c)		
	CG	MTS	Others*	Total	CG	MTS	Others*	Total	CG	MTS	Others*	Total	CG	MTS	Others*
17	52	69	0	121	15	13	0	28	96	65	0	161	163	147	
18	72	148	0	220	19	22	0	41	86	118	0	204	177	288	
19	50	95	2	147	11	18	0	29	59	88	1	148	120	201	
20–24	244	381	16	641	38	69	6	113	154	262	4	420	436	712	20
25–29	94	185	5	284	14	45	1	60	114	208	2	324	222	438	8
30–34	32	77	1	110	7	22	0	29	52	107	6	165	91	206	7
35–39	8	18	1	27	3	2	2	7	14	23	4	41	25	43	7
>39+UNK	4	19	5	28	2	1	1	4	7	20	6	33	13	40	12
Total	556	992	30	1,578	109	192	10	311	582	891	23	1,496	1,247	2,075	61

* USPHS, USN. and dependents.

station or camp may have a relatively constant mean strength and population density but the rate of change of the population and the rapidity with which recruits pass through a training center or other type of shore establishment may be factors of importance. At the Maritime Service this factor was seemingly relatively constant; recruits continued to pass through that station for 7–8 weeks' training * during the period covered by this study. On the other hand, changes at the Coast Guard station presented an interesting epidemiological contrast, a transition in type of population.† From January, 1943, through November, 1943, this station was largely engaged in recruit training (a population drawn from civil life), the training period being of 3 months' duration. In November recruit training rapidly tapered off and a number of school courses for men of more extensive service followed. Then early in February, 1944, another transition occurred, the station becoming largely a reassignment center for men of relatively longer service than the previous population. Many of the latter had extended sea duty oftentimes in small vessels where living conditions were markedly dissimilar to those prevailing on shore establishments. With such abrupt population shifts—particularly in populations which in themselves may be characterized by markedly different prevalences—efforts to interpret monthly morbidity rates on a seasonal basis would seem unwarranted.

The annual rate for the month of the 1,952 admissions of ulcerative gingivostomatitis (Vincent's infection) for the period January, 1943, through March, 1944, divided according to U. S. Coast Guard and U. S. Maritime Training Service is shown in Table 2.

NUMBER OF CASES OF VINCENT'S DISEASE (IN-PATIENTS) ADMITTED TO THE EAR, NOSE, AND THROAT DEPARTMENT OF THE HOSPITAL DURING 1943

For an estimate of the ratio that the throat types of Vincent's disease bear to the more common form of the gingival involvement, the number and classification of all Vincent's cases admitted to the Ear, Nose, and Throat Clinic of the Hospital during 1943 was obtained from the hospital records. These data are given in Table 3.

Inspection of these data indicates that:

1. A relatively small percentage of Vincent's cases involve the throat.
2. From the standpoint of medical and dental care, treatment of Vincent's disease in general is almost wholly an out-patient dental problem.

TREATMENT AS IT MIGHT RELATE TO EPIDEMIOLOGY

In general, epidemiology is not chiefly concerned with therapeusis *per se* except in so far as treatment may influence morbidity or mortality rates. However, when dealing with a disease, the etiology of which is not clear, study of a group response to different therapeutic measures may shed some light on obscured aspects of its etiology and therefore warrant epidemiologic inquiry.

Of the admissions to the Dental Clinic for Vincent's infection, a high percentage were treated under a therapeutic regimen developed by Drs. Robert A. Scroggie and James S. Miller.* In this regimen, medication was considered as playing a relatively minor rôle; restoration of a high level of mouth hygiene, at the earliest pos-

* During periods of unusual shipping demand this time may have been somewhat shortened.

† In a general discussion on Vincent's infection by Mark[3] other circumstances and conditions peculiar to naval personnel are enumerated. In studying populations of this type many of these factors require careful epidemiological consideration.

* Executive Officer and Dental Officer in Charge of the Clinic respectively. The general therapeutic procedures followed at this Clinic were recently discussed by Brooks and Wilson.[8]

TABLE 2

Annual Rate for the Month of 1,952 Admissions for Ulcerative Gingivostomatitis (Vincent's Infection) at the Dental Clinic, USPHS Hospital, Sheepshead Bay (N. Y.), Divided According to U. S. Coast Guard and U. S. Maritime Training Service (January 1, 1943–March 31, 1944, Inclusive)

	U. S. Coast Guard		U. S. Maritime Training Service	
	Number of Cases	Annual Rate per 1,000	Number of Cases	Annual Rate per 1,000
1943				
January	30	43.5	47	46.6
February	27	40.9	41	45.7
March	28	40.7	41	43.5
April	42	64.6	36	44.2
May	32	50.8	82	103.7
June	34	55.3	65	83.2
July	45	77.2	129	139.7
August	70	118.0	138	143.3
September	79	132.8	108	125.2
October	82	124.9	111	125.6
November	54	85.1	89	107.6
December	32	52.7	105	130.8
Unknown	1	....	...	....
Total 1943	556	73.1	992	94.9
1944				
January	19	38.5	92	112.1
February	29	73.9	99	115.1
March	77	148.0	88	100.4
Total 1st Quarter 1944	125	89.1	279	109.4

TABLE 3

		Coast Guard	Maritime Service	Others	Total
Vincent's angina	610-141	6	8	0	14
Vincent's infection of the mouth	610-1413	8	19	1	28
Vincent's infection of the tonsil	634-1413	12	20	1	33
Laryngitis due to *Borrelia vincentii*	330-1413	0	0	0	0
Vincent's infection of the tongue	612-1413	0	0	0	0
Vincent's infection of lingual tonsil	635-1413	0	0	0	0
Total admissions to E.N.T. All Vincent's conditions		26	47	2	75
Total Admissions to Dental Clinic in 1943 Ulcerative Gingivostomatitis (Vincent's infection)		556	992	30	1,578

sible moment, a matter of primary importance. Very briefly, treatment consisted of immediate * gross scaling (removal of as much as possible of the gingival calculus) at the first sitting, use of a bland medicament (viogen),† detailed instructions in oral hygiene, and an insistance upon a high level of patient coöperation in early attainment and continued maintenance of oral hygienics. Subsequent treatments—about 48 hours apart—consisted of further odontexesis, curettage, an application of viogen, and a careful check of the oral hygiene practices being followed by the patient. For comparative purposes this regimen will be referred to as the "Scroggie-Miller" treatment.

Those treated with chromic acid, silver nitrate, etc., or in some instances

* The question of immediate gross scaling is not particularly novel. It has been proposed by Merritt [9] among others for many years. Further support may be found in the recent papers of Schluger,[10] Stammers,[11] and Leatherman.[12]

†The efforts of the patient to remove by thorough brushing the effects of a dye such as viogen (1 gram crystal violet, 1 gram brilliant green, and 50 per cent alcohol, q.s. 100 ml.) generally results in the maintenance of a high level of oral hygiene.

TABLE 4

Comparison in the Average Number of Treatments Between the "Scroggie-Miller" Treatment and "Other" Therapy in 1,548 Cases of Ulcerative Gingivostomatitis Admitted to the Dental Clinic, USPHS Hospital, Sheepshead Bay (N. Y.), in 1943

U. S. Coast Guard

	Number of Cases				Average Number of Treatments	
Oral Diagnosis	*"Scroggie-Miller"*	*Other*	*Total*	*Treatment*	*"Scroggie-Miller"*	*Other*
				Completed:		
Ulcerative Gingivostomatitis (Vincent's infection)	354	46	400	Uninterrupted	3.2	5.2
	37	17	54	Interrupted	4.6	6.3
				Not completed:		
	85	10	95	Incomplete	2.6	4.7
	..	..	7	Unknown: none recorded	...	...
	476	73	556			

U. S. Maritime Training Service

				Completed:		
Ulcerative Gingivostomatitis (Vincent's Infection)	532	96	628	Uninterrupted	3.2	4.3
	63	21	84	Interrupted	4.3	6.1
				Not completed:		
	227	26	253	Incomplete	2.3	4.0
	..	..	27	Unknown: none recorded	...	...
	822	143	992			

with two or more agents at different sittings are known as the "other treatment" group. Scaling of teeth during the course of treatment in this group varied.

Both groups used a solution of sodium perborate for a mouth wash.*

In respect to continuity of treatment, the several groups were divided as follows:

1. Completed cases in which there were no broken appointments and the therapeutic regime was carried through to completion without interruption.

2. Completed cases in which the therapeutic regime was interrupted by one or more broken appointments prior to discharge from the Periodontia Department as a treatment completed case.

3. Incompleted cases, or those records in which the patient failed to return for further treatment, were "shipped out," or otherwise failed to carry treatment through to completion.

4. Treatment unknown, or those schedules showing no record of treatment.

A comparison of the average number of treatments (sittings) per patient of those receiving the "Scroggie-Miller" therapy and those listed under "other" treatment is shown in Table 4.

In attempting to assess from an epidemiological viewpoint mass clinical data taken from hospital records, one naturally approaches any question of interpretation with extreme caution. Obviously it is not possible to determine whether some inherent or unconscious bias developed in the selection of the patients who fell in one treatment category or the other; however, the broad distributional differences seemingly warrant a thoroughly controlled clinical study for such light that it may shed on etiology and control.

SUMMARY

1. After a century and a half of experience and study, the epidemiology of ulcerative gingivostomatitis (Vincent's infection) is still confusing and largely undefined. A thoroughgoing epidemiological study of this syndrome is urgently needed.

2. Inspection of the clinical records at the U. S. Public Health Service Dental Clinic, Sheepshead Bay (N. Y.) disclosed:

* Diluted hydrogen peroxide would have been the mouth wash of choice but problems of distribution in a population of this nature necessitated the use of sodium perborate. Only enough sodium perborate powder was given for several days' use in order to check for possible deleterious effects.

(a) The annual admission rate for ulcerative gingivostomatitis (Vincent's infection) in 1943 for the U. S. Coast Guard was 73.1 per 1,000 strength; for the U. S. Maritime Training Service, 94.9 per 1,000 strength.

(b) Vincent's disease in general seems predominantly a dental problem. In 1943 there were 1,578 cases of Vincent's infection admitted to the Dental Clinic in contrast to 47 cases of Vincent's angina or Vincent's infection of the tonsil admitted to the hospital.

(c) Gross scaling (removal of as much as possible of irritants such as supragingival and subgingival calculus, soft debris, etc.) at the *first sitting*, and use of a bland medicament in conjunction with full patient coöperation in attaining and maintaining a high level of oral hygiene was effective in restoring gingival health.

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Sample Censuses in Congested Production Areas

The Committee for Congested Production Areas of the Executive Office of the President, Washington, has published a brochure entitled "Observations on the Sample Censuses in Ten Congested Production Areas." It was published in December, 1944, by the group of which Corrington Gill is the Director. Although this is only a partial answer to the population shifts which have taken place in the United States during recent years, anyone who is dealing first hand with these problems will find illumination in the diagram showing the origins of the migrants, with other factors bearing on population mobility, on the distance of the move and on the implication of this most disturbing factor in our census computations. Charts are presented showing the sources of out-of-town war workers for Puget Sound, for Portland, for San Francisco, Los Angeles, San Diego, Hampton Roads, Detroit, and Mobile.

Vincent's Infection—A Wartime Disease

Observations on the Oral Spirochetal Flora Present in Vincent's Infection *

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ROUTINE observations of the oral cavity indicate the liability of the mucous membrane and supporting soft tissues of the teeth to numerous types of lesions. These pathological alterations vary from mild inflammations of the gingival tissues to cases in which there is massive necrosis that may involve and destroy considerable portions of the face.

Local inflammation of the oral mucosa and gingivae, as the result of trauma from faulty occulsion, tartar deposits, and ill fitting dental appliances, account for many oral lesions. However, there are certain disease conditions such as Vincent's angina, ulcerative stomatitis, and noma which are characterized by various gradations of necrosis, pseudo-membrane formation, and fetid odor, whose specific etiology is assumed but not definitely ascertained. The constant predominance of spirochetes and fusiform bacilli in such conditions endows them with a possible related etiological significance. This contention is further supported by the fact that under such conditions these organisms are found to invade the soft tissues of the mouth. The spirochetes are usually found deep in the submucosa, far in advance of the necrotic tissue and of the fusiform bacilli.[1, 2, 3] Even though this evidence is suggestive, conclusive evidence has never been presented that these organisms are the etiological agents responsible for such conditions.

There is a very definite need for experimentation with pure cultures of the various members of the oral fuso-spirochetal flora, both separately and in combination with pure cultures of the other oral bacteria, in order to elucidate the exact relationship of these organisms to the disease. The fusiform bacilli and most of the associated organisms in such conditions may be isolated, cultivated, and classified with a reasonable degree of accuracy. However, the various members of the spirochetal flora have presented an enigma in this respect. The greatest difficulty has been from a technical consideration in isolation and cultivation of these organisms on artificial media and the identification of them accurately once they have been isolated.

It is the purpose of this presentation to report some of our observations on the isolation and cultivation of certain of the oral spirochetes associated with cases of ulcero-membranous gingivitis. In addition, we shall compare the findings observed when pure cultures of certain of the spirochetes are studied microscopically, using heat-fixed stained smears observed by direct illumination and wet preparations of the same organisms observed by dark-field illumination, and point out the risk of employing the former method as a means of establishing the identity of the oral spirochetal species.

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HISTORICAL

Reports in the literature on the subject of Vincent's infection indicate that Veillon in 1894,[4] Plaut in 1894,[5] and Vincent in 1896,[6] were the first to associate the spirochetes and fusiform bacilli with ulcero-membranous lesions. However, Veillon and Plaut merely mentioned the presence of spirochetes and fusiform bacilli and did not definitely associate them with the disease. Vincent in 1896[6] and 1898[7] described in minute detail the fusiform bacilli which he associated with "hospital gangrene" and pharyngitis, but merely mentioned the presence of spirochetes in such cases. By 1905[8] he presented detailed descriptions of both the spirochetes and fusiform bacilli and associated them with the disease.

In the 19th century literature on the subject of ulcerative stomatitis are found two articles by Jules Bergeron, a book in 1859[9] and an extensive review in 1883.[10] His work is most comprehensive, including epidemiology, pathology, and bacteriology. From his epidemiological evidence he considered the disease communicable and considered certain predisposing factors, such as nutrition, fatigue, and the peculiar conditions of military and institutional life to be essential in the production of the disease. In an effort to find a specific etiological agent, Bergeron[10] consulted Pasteur. After microscopic examination of material removed from lesions in a case of ulcerative stomatitis, Pasteur was impressed by the presence of large numbers of "spirilla" and postulated that these organisms should be the agents responsible for the disease. He cultivated the "spirilla" in an appropriate liquid medium and inoculated rabbits with his cultures but was not successful in producing lesions in these animals.

Following the work of Pasteur, Bergeron enlisted the service of Netter, one of his young interns, whom he considered an expert in the field of bacteriological research. Bergeron[10] states that Netter also found "spirilla" in material obtained from cases of ulcerative stomatitis and indicated that they were morphologically similar to the organisms described by Obermeier in cases of "recurrent typhus," now known as relapsing fever. In addition, these organisms appeared as elongated filaments without appreciable double contours under the strongest illumination, flexible, very motile, and forming some "spires." Netter was successful in growing the "spirilla" in ascitic fluid and in a defibrinated fluid of pleurisy, and was able to produce small vesicles in rabbits with his "second cultures," but these did not ulcerate and gradually disappeared. Like Pasteur, Netter considered the "spirillum" the etiological agent of ulcerative stomatitis.

From the evidence presented it is obvious that Pasteur and Netter specifically incriminated a particular "spirillum" as the etiological agent of ulcero-membranous stomatitis. Netter described it most accurately, so that his organism was undoubtedly the same as the spirochete we now consider as *Borrelia vincentii*. In addition, both Pasteur and Netter were able to cultivate the "spirillum" in question and the latter used ascitic and pleural fluid which is still employed as the basis of present-day media for isolating and cultivating the oral spirochetes. It is unfortunate that a detailed description of their methods of cultivation was not presented. On the basis of priority, Bergeron, Pasteur, and Netter should be credited with having described, cultivated, performed animal experiments, and associated the spirochetes with the ulcero-membranous stomatitis syndrome.

Following the discovery of *Treponema pallidum* by Shaudinn in 1905, there was frenzied effort to isolate and cultivate the various spirochetes peculiar

to man and attempt to associate them with disease processes. Mühlens,[11] and Mühlens and Hartmann[12] described a technic for the isolation of certain of the oral spirochetes and they were later followed by Noguchi[13, 14] and others.[15–26] Such work indicates that these organisms are anaerobes and that serum, blood, or ascitic fluid is essential for their growth. Addition of fresh tissue to the medium has been used in many instances, but is apparently not indispensable.

In general, most methods used in the past for the primary isolation of the oral treponemes are modifications and adaptation of the principles advocated by Noguchi.[13, 14] The methods employed, with the exception of those advocated by Wichelhausen,[25] Schmamine,[16] Ecker and Weed,[20] depend on the ability of the spirochetes to penetrate a suitable medium and grow away from the oral contaminants. In our experience in trying to duplicate the work of other investigators, particularly the methods of Noguchi,[13 14] it was found that the most difficult phase of the work was in obtaining pure subcultures from highly contaminated primary cultures contained in test tubes. Due to the longer lag phase in growth of the spirochetes, the contaminating bacteria invariably developed more rapidly and spread over the free surface of the small agar column from the central stab canal. This was further complicated by disruption of the agar by gas forming bacteria so that it was almost impossible to obtain spirochetes in the pure form from the highly contaminated culture.

More recently, the author[26] introduced a successful method for primary isolation and cultivation of the smaller oral treponemes.

TECHNIC AND MEDIA

The technic employed in our studies utilized 25 ml. beakers, approximately 3.5 cm. in diameter and 5 cm. in length, which served as containers for the primary cultures.[26] After the use of many types of solid media, it was found that a veal heart "hormone" medium[21, 23, 26] of low agar concentration, which is essentially a modification of Huntoon's "hormone" agar[27] was most efficacious for growth of the smaller oral treponemes. This medium served as an agar base and was further enriched at the time of use by the addition of 1 ml. of ascitic fluid and 1 ml. of a 1 per cent solution of cysteine hydrochloride to 10 ml. of the melted agar base. This quantity of finished medium was then placed in each container, which resulted in a layer of agar approximately 17 mm. in depth. After the agar had solidified, a well was prepared in the center of the column of agar to a depth of about 12 mm. This was accomplished with the aid of a glass pipette with a bore of 4–5 mm. in diameter.

Subgingival scrapings from cases of Vincent's infection were used as a source of oral spirochetes. This material was mixed with a few drops of a liquid medium, described elsewhere,[26] to form a heavy suspension which was then observed by dark-field illumination to confirm the presence of the desired organisms. With the aid of a capillary pipette, several drops of the inoculum were introduced into the well previously prepared in the enriched agar medium. The charged plates were then placed in an upright position in jars rendered anaerobic with hydrogen.

The medium employed for subcultures was the same as that used for primary plates. A capillary pipette was used in all instances to remove a plug of spirochetal-infiltrated agar from the primary plates for microscopic examinations and/or subcultures.

RESULTS

The first indications of spirochetal

growth became evident in primary plates in as short a time as 24 hours, and these were ready for transfer in from 3 to 7 days, an average of 5 days being the rule. These cultures exhibited a characteristic type of growth which was evidenced in one of two ways: as a delicate white cloudy haze extending outward from the reservoir into the surrounding medium, or as compact nodules appearing in the proximity of the well. In the latter instance, the nodules progressively increased in size and ultimately produced the characteristic haze associated with spirochetal growth.

By this method the contaminating organisms, including the gas forming bacteria, are restricted to the confines of the well, thereby preventing contamination and disruption of the agar medium which overcomes the disadvantage of the method described by Noguchi.[13, 14] However, the treponemes proliferate and infiltrate the sursounding medium and grow in ever widening circles beneath the sterile agar surface. The spirochetes may then be obtained free of contamination by removing a plug of spirochetal infiltrated agar with a capillary pipette as far from the well as possible. By this method as many as twenty pure cultures have been made from a single primary plate. Pure subcultures were obtained routinely in as short a period as from 36 to 72 hours and never more than 5 days.

The effectiveness of this technic is exemplified by the short time required for obtaining primary growths, and the large numbers of initial pure subcultures that may be obtained from a single plate. The use of a well in primary plates is a decided improvement over the older methods of inoculating a suitable medium by stabbing with a straight wire or a capillary pipette. The well is capable of holding a larger inoculum than could be had by either of the stab methods. Consequently, larger numbers of spirochetes are held within the confines of a highly nutritious medium; which permits rapid multiplication and penetration of the agar. This condition is apparently a factor in materially reducing the time required for primary isolation of the treponemes. Further, the wall of the well serves as a filter through which the spirochetes may penetrate and become isolated from the contaminants.

Initial subcultures have been successfully obtained from 3 months old primary plates in 36 hours, which demonstrates the effectiveness of the well in restricting the contaminants to its immediate vicinity. In addition, it has not been found necessary to rush transfer procedures as has been advocated.[23] Primary plates, as well as pure cultures, have been exposed to air at intervals ranging from 2 to 24 hours without apparent ill effects or undue time in subsequently obtaining pure cultures. Although a reduced oxygen potential is a factor in cultivating the oral spirochetes, the organisms are not so fastidious in this respect as formerly believed. All spirochetal strains isolated in our work have been grown in air by the addition of various types of reducing substances and in these instances the anaerobiosis was apparently not complete.

By the preceding method we have been able to isolate the smaller oral treponemes routinely in the laboratory. In addition, strains morphologically similar to *Borrelia vincentii* have been isolated in pure culture on two occasions by modification of the technic previously described. These organisms have also been obtained in mixed spirochetal culture along with *Borrelia buccale* on numerous occasions. Attempts are being made to refine these methods for routine isolation and cultivation of *B. vincentii* and *B. buccale*.

Having once isolated members of the oral spirochetal species one is con-

fronted with the problem of their identification and classification. The only method available at the present time is that based on morphological characteristics. With a little experience it is possible to identify the following spirochetal types, by dark-field examination of living organisms: a smaller oral treponeme that corresponds to that of *Treponema microdentium* (Noguchi, 1912), a larger double contoured form referred to as *Borrelia buccale* (Dobell), and an intermediate, large, single contoured type, which corresponds to descriptions in the literature [28, 29, 2] for *Borrelia vincentii* (Blanchard, 1906). Those species described as *Treponema mucosum* (Noguchi, 1912) and *Treponema macrodentium* (Noguchi, 1912) are not so clearly delineated, and if they exist as independent species, they have not been segregated with accuracy from the above types by us on the basis of morphological critera.

The use of heat-fixed stained smears for microscopic examination and identification of the oral spirochetes have been very misleading. The fine structural differences that exist between the species may be so distorted or obscured by such methods as to create confusion as to the identity of the spiral forms represented.[30]

By the use of pure cultures of the smaller oral treponemes, a large spirochetal form similar to those described in the literature for *Borrelia vincentii*, mixed spirochetal cultures containing *Borrelia buccale* and supplementing this material with organisms obtained in cases of oral infection, we shall attempt to point out the discrepancies of the heat-fixed stained smear when observed by direct illumination as compared with wet preparations of similar organisms observed by dark-field illumination. Both the stained and the wet preparations utilized in this work were made from the same bacterial suspensions. The use of pure cultures waives any doubt as to the forms under consideration.

The stain utilized for the dried films was crystal violet; one part of a saturated solution of the dye in 95 per cent alcohol and 9 parts of distilled water.

Observations of smeared preparations obtained from lesions in cases of Vincent's infection are in most instances conspicuous by the lack of the presence in any appreciable numbers of the smaller oral treponemes. However, examination of the same material by dark-field illumination reveals that they constitute a large percentage of the representative spirochetal types. Semple, Price-Jones, and Digby [31] indicate that *Treponema dentium* (smaller oral treponemes) constitute about 22 per cent of the total number of spirochetes in Vincent's infection, this approximates our observations.[32] The probable explanation of such differences observed by the two methods is based on several factors. The act of drying a smeared preparation in air will cause plasmolysis of the spirochetal body.[33] The extreme length of the oral treponemes in comparison with their width tends to cause the organisms to unfold their closely knit, symetrically placed coils when dried in air. This tendency is further accentuated by heating during fixation.

These organisms have been found to be more stain resistant than the other oral spirochetes, which often necessitates prolonged staining and in certain instances steaming of the dye to obtain a suitable preparation. This procedure further contributes to the alteration of their morphology. The end results are wavy distorted filaments whose modified morphology may vary from a mild to excessive degree when compared with the same organism in the living state by dark-field examination. Although this morphological alteration is not fully evident in all the cells, it usually predominates in the greater

PLATE I

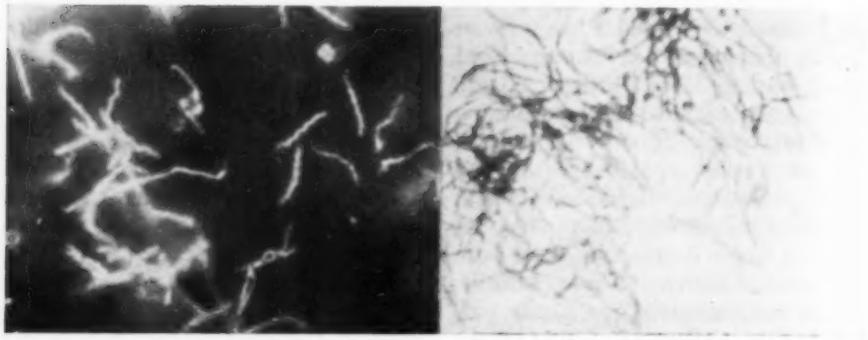

FIGURE 1—Dark-field and stained smear preparations from a pure culture of the smaller oral treponemes; fourth passage (X 1455).

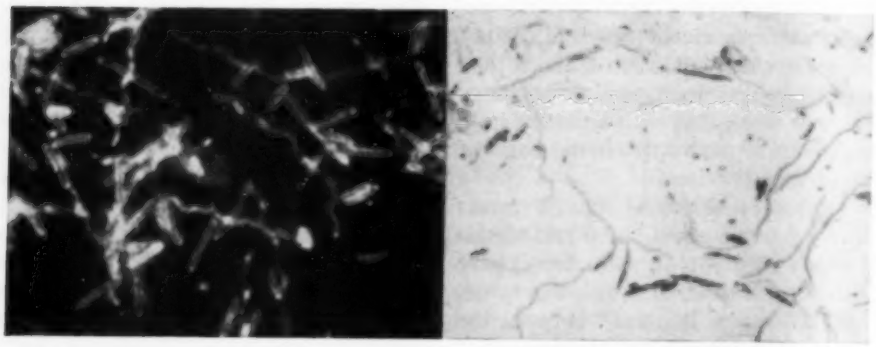

FIGURE 2—Dark-field and stained smear preparations of *Borrelia buccale* and other oral organisms obtained from a case of marginal gingivitis (X 1455).

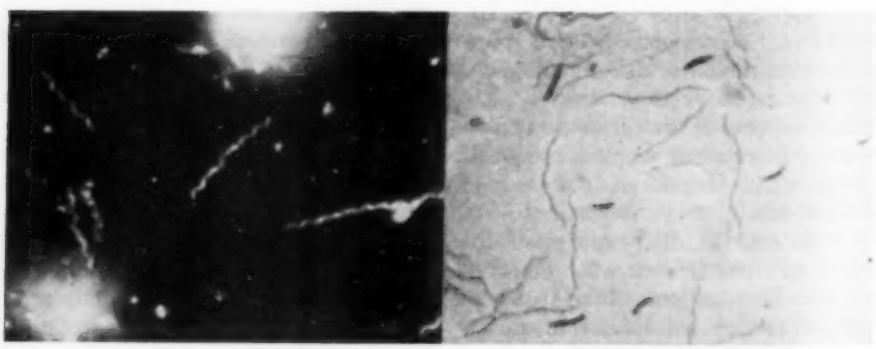

FIGURE 3—Dark-field and stained smear preparations of oral spirochetes that conform with morphological descriptions in the literature for *Borrelia vincentii*. In the stained smear the three forms almost parallel and in the center of the field are the organisms in question. The remaining spiral forms are *Borrelia buccale*. These organisms were obtained from a tonsillar lesion in a case of Vincent's angina.

percentage of individuals represented in such smears.

Figure 1 represents photomicrographs of a dark-field and a stained smear preparation made from a pure actively growing culture of one of the smaller oral treponemes. The former shows quite clearly the closely knit arrangement of the fine symmetrically placed coils as well as the fine tapering extremities which are characteristic of the species. It is not double contoured. Several organisms are present in which no coils are in evidence; these are found occasionally in pure cultures in chains of various lengths, and constitute an extremely small percentage of the total numbers of organisms in a given specimen. The stained smear made from the same suspensions exhibits spirochetes with a marked degree of distortion. These changes are most evident in regard to the shape, size, and spacing of the spirals. The tendency of these organisms to unfold their spirals and assume a straight form in dried film preparations is adequately portrayed. These altered morphological types vary from almost straight forms to long wavy filaments which exceed the length, and in some instances the width of the spirochetes in the control dark-field photomicrograph. Many of these types could be easily confused with intermediate forms of the oral borrelia. Neither the fine tapering extremities nor the terminal filaments are in evidence.

The phenomenon of altered morphology of the small oral treponemes in stain smears is not restricted to this species of organisms but can also be demonstrated in the large oral borrelia.

Smeared preparations obtained from lesions in acute cases of Vincent's infection exhibit numerous large spirochetes with three to five widely spaced shallow spirals which imparts to them the appearance of wavy filaments. These forms are frequently referred to as *Borrelia vincentii*. However, dark-field examination of such material indicates the fallacy of such an assumption. In many instances *Borrelia buccale* may far outnumber the Vincent's spirochetes.[32] Semple, Price-Jones, and Digby[31] report that in Vincent's infection *Borrelia buccale* constitute 70 per cent of the spirochetal forms present. No mention is made of the number of *B. vincentii*. The ease in confusing *B. buccale* and *B. vincentii* in stained smears may be remedied by the use of the dark-field microscope as sufficient differences are found to exist between the two species by this method to identify them with a uniform degree of accuracy.

In Figures 2 and 3 are found dark-field photomicrographs of *Borrelia buccale* and *Borrelia vincentii;* the former organism was obtained from a case of marginal gingivitis and the latter from a tonsillar lesion in a case of Vincent's angina. It is evident that *B. buccale* is longer, wider, and the coils are proportionally larger and more widely spaced than those of *B. vincentii*. In addition *B. buccale* is double contoured while *B. vincentii* does not present this appearance which is an important point in differentiating between the two forms.

In contrast, the width of *B. vincentii* is from one-half to two-thirds that of *B. buccale* so that the former organism appears as a long, thin, graceful spirochete. The extremities of *B. buccale* present as a rule abruptly tapered ends, whereas *B. vincentii* has both extremities more delicately tapered and pointed. Terminal filaments are occasionally observed in both species. In addition, under low magnification (645 X) both *B. buccale* and *B. vincentii* reflect light in a characteristic manner which is evidenced as a yellowish tinge whereas the smaller treponemes present a brilliant white hue. This difference although present

PLATE II

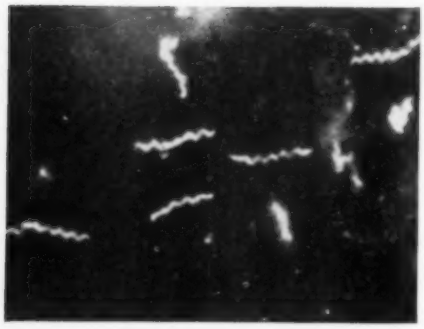

FIGURE 4—Dark-field preparation of *Borrelia buccale* from a mixed spirochetal culture; third passage. The inoculum for this culture was obtained from the same source as Fig. II.

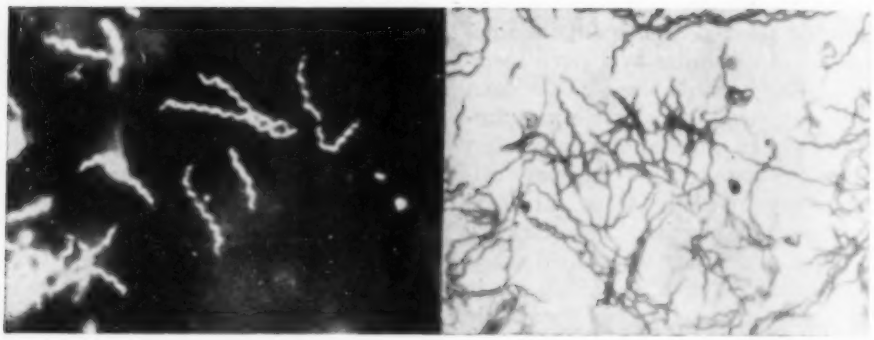

FIGURE 5—Dark-field and stained smear preparations of a pure culture, third passage, of large oral spirochetes which coincide with descriptions in the literature for *Borrelia vincentii*.

is not so pronounced under higher magnification (1455 X).

Figures 2 and 3 also include photomicrographs of heat-fixed stained smears of *B. buccale* and *B. vincentii*. These preparations were made from the same suspension as their mates displayed in the corresponding dark-field photographs. Here, as in the case of the smaller oral treponemes, it is apparent that the greatest amount of physical distortion is found in relation to the shape, size, and spacing of the coils. The extreme length and the wide coils characteristic of these species increases their tendency to assume a straight line when dried in air and fixed by heat. As seen, both photographs exhibit spirochetes varying from almost straight forms to thin, wavy, ribbon-like filaments possessing several widely spaced irregular shallow spirals which are very unnatural when compared with their mates shown in the control dark-field photomicrographs. The shrinking and narrowing of the cell bodies is most apparent in *B. buccale*. This change when associated with other morphological alterations is sufficient to cause difficulty in identifying with any degree of accuracy the form referred to as *B. vincentii* as it may be confused with *B. buccale*, or *B. buccale* may be mistaken for the pathogenic species. The extremities of both organisms may exhibit the pointed ends or they may be blunted, depending on whether the smear preparations were properly pre-

pared. The terminal protoplasmic filaments have never been observed by us in such preparations.

Of the larger oral spirochetes, *B. buccale* has been reported isolated on few occasions by technics difficult to reproduce.[21, 34, 2] Figure 4 represents a dark-field photomicrograph of *B. buccale*, obtained during our experiments in cultures in association with the smaller treponemes and free from other contaminating oral bacteria. The inoculum for this culture was obtained from the same source as the organisms portrayed in Figure 2. It is apparent that this form is shorter and narrower and in addition the spirals are proportionally smaller and more compact than those obtained from the original suspension. With these exceptions the morphological characteristics are the same as those organisms previously described.

Conclusive evidence has never been presented that *B. vincentii* has been obtained in pure cultures. Figure 5 represents photomicrographs of a dark-field and a stained smear preparation of a pure culture of large spirochetes obtained in this laboratory which coincides with such descriptions in the literature for *B. vincentii*. They are morphologically different from our strains of treponemes as well as *B. buccale*. The dark-field illustration shows quite clearly that they are large organisms possessing large, widely spaced, symmetrically placed spirals; they are not doubly contoured and have delicately pointed ends and are identical morphologically with those organisms represented in the dark-field photomicrographs in Figure 3. The spirochetes displayed in the stained smear exhibit the same distortion previously described for the other oral species which is most evident in regard to their coils. These organisms vary from almost straight forms to wavy filaments possessing widely spaced irregular spirals. Many of the extremities are delicately pointed, others are rounded and blunted. Numerous intermediate forms are in evidence.

SUMMARY

A method is presented for the isolation and cultivation of certain of the oral spirochetes associated with lesions in cases of Vincent's infection. The technic is based primarily upon the use of a well for holding the spirochetal containing inoculum in the confines of a highly nutritious medium of low agar concentration, which favors rapid multiplication and penetration of the medium by the spirochetes.

In addition, observations are reported on the morphological differences of certain of the oral spirochetes examined in air-dried, heat-fixed, stained smears examined by direct illumination as compared with the same organisms in the living state by dark-field illumination. The spirochetes utilized in this work were obtained from pure cultures and when necessary were supplemented by organisms procured from lesions in cases of oral infection. *Our results demonstrate the unreliability of the stained smear for the identification of the oral spirochetal species.* Such methods of preparation of smears were found to be responsible for masking fine structural detail, a moderate to extreme degree of distortion of the smaller oral treponemes, as well as shrinkage and distortion of the oral borrelia. These morphological alterations are sufficient to create a false impression of the organisms in question. However, when the same organisms were examined by dark-field illumination sufficient morphological differences were evident so that they could be identified with little difficulty. Until these facts are recognized, confusion will continue to exist in the identification of the spirochetal types associated with oral fusospirochetal infections.

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Vincent's Infection—A Wartime Disease

Reporting of Vincent's Infection by State Health Departments *

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NO doubt, the accuracy of diagnosis and the number of cases of Vincent's infection reported to state health departments might be questioned. It seems that the reports should be closely scrutinized and studied with this thought in mind, "Does the data as collected really give a true picture of the prevalence of Vincent's infection?"

Fowler [1] recently reported that 22 states listed as reportable either Vincent's angina or Vincent's infection. To each of these state health departments was sent a questionnaire shown as Table 1, which asked for pertinent information on the reporting of the disease. Twenty state health departments returned the questionnaire, and the information received serves to make up the material to be given and is briefly presented as Table 2.

From the reports received, the disease reportable in Florida, Idaho, Illinois, Indiana, Kentucky, Maine, Minnesota, New Hampshire, Oregon, Tennessee, and Vermont is Vincent's angina; and all types of Vincent's infection are reportable in Georgia, Iowa, Kansas, Michigan, Nevada, North Carolina, North Dakota, Washington, and Wyoming. It seemed generally agreed that even though Vincent's angina is the reportable disease in 11 of the states, many of the cases reported are either a Vincent's stomatitis or an acute form of gingivitis. Also, word has been received from Michigan and Minnesota that Vincent's infection has recently been removed from the list of reportable diseases, and from North Carolina the information that its removal is being considered.

One question included in the questionnaire which is of paramount importance in the reporting of Vincent's infection is, "What description of Vincent's infection do you have by law or regulation?" Fourteen of the 20 state departments replied that they had no description while 6 states, namely, Florida, Georgia, Iowa, Kansas, Nevada, and Wyoming, had a description. Four of these states, Florida, Iowa, Kansas, and Nevada have adopted the same description as given in the 1943 edition of the American Public Health Association publication, *The Control of Communicable Disease*. The description reads as follows: "*Recognition of the disease*—Lesions occurring on either the tonsils of the pharynx (angina), or the oral mucosa (stomatitis) are characterized by necrosis, pseudomembranous formation, salivation, and a fetid odor. In angina and the more acute forms of stomatitis there is a marked pain on swallowing, enlarged tender cervical nodes, and slight fever. Acute type of Vincent's infection is characterized by a rapid onset. The affected gums become acutely in-

* Presented before the Dental Health Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 5, 1944.

TABLE 1

Questionnaire

Reporting of Vincent's Infection by State Health Departments

1. Name of state making the report .....
2. Source of report in the state: Physicians only .....
   Physicians and Dentists .....
3. Is the infection of Vincent reportable as Vincent's angina .....
   Vincent's infection .....
4. Number of cases of the disease reported during the past five year period.
   1939 .....
   1940 .....
   1941 .....
   1942 .....
   1943 .....
5. Number of deaths reported by year for the same five year period (32b3 of *International list*).
   1939 .....
   1940 .....
   1941 .....
   1942 .....
   1943 .....
6. What description of the disease do you have by law or regulation? .....
   .....
   .....
7. If Vincent's angina is reportable, do you think that many of the cases reported may have been either a Vincent's stomatitis or an acute form of gingivitis? .....
   .....
8. Do you think that the disease as reported gives a true picture of the prevalence of the disease in the state? .....
9. Are most of the reported cases diagnosed by: Clinical findings .....
   Laboratory findings .....
   Both .....
   Unknown .....
10. Do you find that a few physicians report most of the cases of the disease reported? .....
11. Please add any other comments that you may wish on the subject.

Please return to: Dr. R. H. Hutcheson, Commissioner, Tennessee Department of Public Health, Nashville 3, Tennessee

flamed, the interdental papillae edematous with a soft thick appearance, bleeding easily, and very painful. Necrosis of the interdental papillae occurs with subsequent development of characteristic grayish-white pseudomembrane which is easily removed leaving a raw, profusely bleeding surface. Ulcerations may coalesce and progress to adjoining alveolar palatal, and buccal mucosa spread toward the buccal sulcus being the more common. A distinctive mixed bacterial flora, including spirochetes, fusiform bacilli, and other organisms, characterizes this group of diseases. Differential diagnosis should exclude: supperative periodontitis, diphtheria, mucous patches of syphilis, agranulocytic angina, scurvy, and sprue."

The descriptions used in Wyoming and Georgia are more brief. For instance, the description found in the Georgia official bulletin on the control of communicable diseases reads as follows. "*Recognition of the disease*—when lesions are on the tonsils or pharynx, there is ulcero-membranous inflammation, the exudate being easily removable, leaving raw, bleeding surface, slight fever, pain on swallowing, enlarged, tender cervical lymph nodes. A peculiar redness of the throat is usual. When there is a diffuse gingivitis or stomatitis, the ulceration is less severe, the membrane usually lacking, and the pain and fever less marked. The causative micro-organism can be demonstrated under the microscope."

Since in 14 states the rules and regulations governing quarantine and isolation for communicable diseases do not define Vincent's infection or Vincent's angina, there surely is a wealth of misunderstanding as to the clinical picture that the disease presents. For instance, from one state where Vincent's angina is reportable, the following comment was received: "In April, 1943, a physician reported 175 cases in one county." Surely some type of educational program needs to be developed so that those reporting have the same mental picture of Vincent's infection.

The question, "Do you think that the disease as reported gives a true picture of the prevalence of Vincent's infection?" received a negative reply from 19 state departments with some additional comments such as very poor, very incomplete, and merely a flag.

Previously, it had not occurred to me that in a few states the dentists do not report Vincent's infection. However, from the information received, only physicians report the disease in Idaho, Indiana, Oregon, Tennessee, and Wyoming while in the other states, both physicians and dentists do the reporting.

Since it had been previously noted in Tennessee that a few individuals report most of the cases of Vincent's infection, the question was asked, "Do you find that a few physicians report most of the cases of the disease?" Thirteen of the 17 state departments replied it was so in most cases, 2 that few probably reported most of the cases, and only 2 states reported that the reporting seemed quite general. However, several departments stated that military areas report a considerable number of cases. For instance, 110 of the 205 cases reported in 1942, and 160 of the 325 cases reported in 1943 in Tennessee came from military areas.

As to the most common method used for diagnosis, 10 thought that both laboratory and clinical findings usually served as a basis for diagnosis, 6 departments stated that they were uncertain of the method, 2 thought that most of the cases were diagnosed by laboratory findings, and 2 primarily by clinical findings. In Georgia, of the 880 cases reported during the 5 year period, 1939–1943, 310 cases were diagnosed by clinical findings, 565 by

TABLE 2

Information Received from Twenty of Twenty-two States on Vincent's Infection Reporting *

State	Florida	Georgia	Idaho	Illinois	Indiana	Iowa	Kansas	Kentucky	Maine	Michigan ‡	Minnesota ‡	Nevada	New Hampshire	North Carolina	North Dakota	Oregon	Tennessee	Vermont	Washington	Wyoming
Is the disease reported as Vincent's infection (V.I.) or Vincent's angina (V.A.)?	V.A.	V.I.	V.A.	V.A.	V.A.	V.I.	V.I.	V.A.	V.A.	V.I.	V.A.	V.I.	V.A.	V.I.	V.I.	V.A.	V.A.	V.A.	V.I.	V.I.
Is there a description of Vincent's infection by law or regulation?	Yes	Yes	No	No	No	Yes	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	Yes
Do the reported cases give a true picture of prevalence?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	...	No	No	No	No
Who reports Vincent's infection? †	P.D.	P.D.	P.	P.D.	P.	P.D.	P.	P.D.	P.D.	P.D.	P.D.	P.D.	P.D.	P.D.O.	P.D.	P.	P.	P.D.	P.D.	P
Do you find that a few physicians report most of the cases?	Yes	Probably	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Probably	Yes	Yes	...	Yes	...	Yes	No	...	Yes
Average morbidity rate per 100,000 population for 1939–44	7.5	5.6	1.4	3.4	2.3	1.9	8.7	5.4	5.4	4.0	3.3	...	..	1.9	8.9	13.9	7.2	14.8	2.8	4.4
Are most cases diagnosed by: A. Clinical findings B. Laboratory ‡ C. Both D. Unknown	C	B	D	C	D	C	C	A	C	C	A	C	C	C	B	D	D	C	D	D

* The two states not included are: Ohio and Rhode Island

† P—Physician, D—Dentists, O—Others

‡ Vincent's infection recently removed from list of reportable diseases

laboratory findings, and in 5 cases the method was unknown.

Several of the states have shown a marked fluctuation in the number of cases reported each year during the 5 year period, 1939–1943. Some of the greatest differences in year by year reporting of Vincent's infection were found in Iowa with 19 cases reported in 1941, and 175 cases in 1942; in Kentucky with 444 cases reported in 1941, and 48 in 1942, and in Florida with 71 cases reported in 1941, 145 in 1942 and 308 in 1943. However, the change may have been due in part to the military camps since both the Florida and Tennessee departments state that military areas are reporting a large number of cases. Similar increases were observed in Kansas and Washington with the number of reported cases in Kansas increasing from 98 in 1942 to 253 in 1943, and in Washington increasing from 48 in 1942 to 129 in 1943.

For comparative purposes, the average morbidity rates per 100,000 population were determined for the 5 year period, 1939–1943 for each state that supplied the cases reported each year. The lowest average rate was observed in Idaho where 1.41 cases per 100,000 population were reported, and the highest rate of Vincent's infection reported in Vermont where 14.75 cases per 100,000 population were reported.

More for general interest than any other reason, the following statements as to the causes of death have been taken from 6 of the 33 death certificates filed in two different states, which were listed during the 1940–1943 period under 32 B of the *International List* as the primary cause of death being Vincent's infection:

1. (a) Bronchial pneumonia 4 days.
   (b) Secondary anemia (1 year). Due to chronic Vincent's infection of chest (1 year).
2. Coronary occlusion. Patient under treatment for hyperthropic arthritis and Vincent's infection of mouth and chronic myocarditis of unknown duration. Progress satisfactory until sudden attack of coronary occlusion.
3. Vincent's infection—both lungs.
4. Vincent's infection, generalized, 3 weeks. Pneumonia, terminal, 12 hours. Kidney and liver involvement, 2 weeks.
5. Vincent's infection of mouth and gastro-intestinal tract . . .
6. Osteomyelitis of maxilla—Due to: Vincent's angina hard palate.

However, on a majority of the death certificates, the cause of death was listed as Vincent's infection or Vincent's angina.

SUMMARY

From 20 of the 22 state health departments where Vincent's infection is a reportable disease, the following information regarding the reporting of the disease has been obtained:

1. In 11 states, Vincent's angina is reportable while in 9 states, the disease is reportable as Vincent's infection.
2. By law or regulation only 6 of the 20 state health departments have a description of the disease.
3. All replies received from state health departments reported that Vincent's infection as reported does not give a true picture of the prevalence of the disease.
4. Only physicians report Vincent's infection in 6 of the states.
5. Thirteen of the replies received stated that a few physicians report most of the cases of the disease, 2 that probably a few report most of the cases.
6. The most common method of diagnosis was thought to be both laboratory and clinical.

CONCLUSIONS

It appears that Vincent's infection is poorly reported and that there should be a clearer understanding as to the clinical picture that the disease presents. Such comments as that the physician reports the disease as Vincent's infection and the dentist as gingivitis leaves much to be desired in the accuracy of reporting the disease.

If Vincent's infection is to remain as a reportable disease and the data

received are to be considered comparable, a better understanding of the entire clinic picture will be necessary as well as the epidemiological and bacteriological aspects of the disease.

REFERENCE

1. Fowler, W. The Reportable Diseases. *Pub. Health Rep.*, 59:317 (Mar. 10), 1944.

The Cleveland Health Museum

"Nurses, Too, Are Health Educators"; "To Colombia, S. A.: One Health Museum"; and "To Protect Your Child's Hearing," Health Museum Digest No. 1—these are among the titles in the February issue of ***Museum News of the Cleveland Health Museum***. The first refers to a three week work shop in health education for nurses to be given at the museum June 18 to July 6, in coöperation with Western Reserve University. The Museum, with its study collections, reference material, and exhibits will give participants real work experience. The need of a "new orientation in health education as practised in nursing" arises out of "new types of medical services, changing emphasis from control of communicable diseases to the degenerative diseases, the shifting of population to an increasing preponderance of older persons, and the growing needs of psychosomatic medicine."

The Health Museum for Colombia was prepared by the Cleveland Museum for the Colombian Government and is made up of duplicates of 73 units of the museum's exhibits and will occupy an area of approximately 2,500 square feet.

Among the items included is a duplicate of "Alimentos Para La Salud," a nutrition exhibit originally prepared for the Mexican Government and now in the National Museum of Hygiene in Mexico City. Thus the first health museum in the United States, opened as recently as November, 1940, has already put a good neighbor policy of its own into effect.

The Digest No. 1, "To Protect Your Child's Hearing," represents the debut of another museum service, the preparation of digests in pamphlet form of radio and other material for lay education in prevention of various physical defects or illnesses.

Ultra-violet Light Control of Air-borne Infections in a Naval Training Center*

Preliminary Report

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THIS study was designed to test the efficiency and practicality of ultra-violet irradiation as a method of reducing the spread of respiratory infection in Navy barracks. In a more general sense it was also hoped that a controlled study of this type on a large scale might give information on the amount of irradiation required for effective control and the differential effect exerted on various diseases of viral and bacterial origin.

While considerable information is now available as to the effect of ultra-violet light in reducing cross-infections in hospital wards, curtailing the incidence of epidemic respiratory diseases in schoolrooms and sterilizing the air about the patient in operating rooms, systematic studies of the effect of ultra-violet irradiation of military barracks has not heretofore been reported.

Such semi-isolated military communities offer advantages for controlled epidemiological studies which are not to be found in most civilian groups. The population under observation can be very large, yet at the same time accurate figures are available as to its precise strength from day to day. Also, in such controlled populations all illnesses from the dispensary visits for minor complaints to more serious cases requiring hospitalization are known and classified by the medical officers of the unit, and complete data on respiratory morbidity in the study population can be recorded and analyzed. Finally, the nature of such semi-enclosed recruit communities

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The views expressed in this report are those of the authors and do not necessarily reflect the policies of the Navy Department.

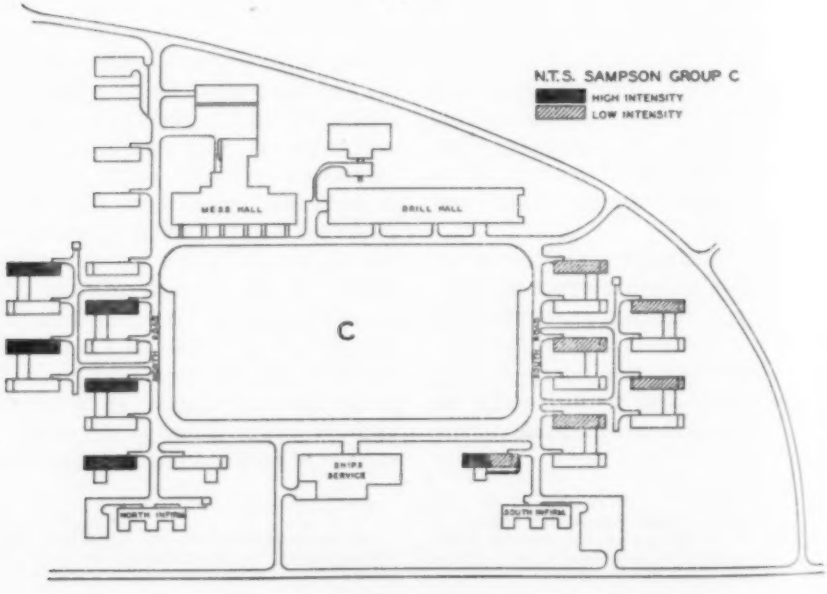
tends to restrict the sources of exposure to infection from outside the compound to a minimum.

While in the present study ultra-violet fixtures were installed only in the barracks, it is obvious that all exposure to respiratory infection did not take place in the sleeping quarters. In general, however, the recruit companies housed one company to a floor in the various barracks kept together with the men in their own company in their daily life on the drill fields, in the classrooms, mess halls, and other places of work and recreation. It was assumed that the prolonged exposure during the hours of sleeping in the barracks was the most important for the transfer of respiratory infection and that ultra-violet irradiation of the air of the barracks would be the most effective and practical means of interrupting the exchange of infectious material among the recruits.

Since the purpose of the study was to evaluate the practicality as well as effectiveness of ultra-violet lights in naval units, irradiation of all the indoors environments where the men might be congregated in their daily activities was not attempted. Lights were not installed in the large drill halls, mess halls, and gymnasiums where the size of these buildings would have made irradiation of the large volume of air in sufficient intensity impractical both from the standpoint of cost and from the number of fixtures which would have been required.

The present study was carried out at the U. S. Naval Training Center, Sampson, N. Y. At this camp naval recruits are received from civilian induction centers and are given their recruit training here before assignment in outgoing units for other stations in the Navy at sea or ashore. At the time of the study, in the winter and spring of 1943–1944, the training period was from 4 to 6 weeks in length. This short period of training and the frequency of incoming drafts made for a very rapid overturn of the population during this period.

FIGURE 1



One or two days were spent after the arrival of the recruits in the camp in physical examinations, the issuance of equipment, and the formation of recruit companies. These companies were then quartered in the units where they spent the entire remaining period of training (Figure 1). These self contained training units consisted of the barracks, mess hall, ships service stores, dispensaries, drill hall and other buildings surrounding the drill field. The usual complement of such units was 4,800 recruits housed in twenty-two 2 story barracks, each containing two companies of 112 men with one company to a floor. During the training period, liberty away from the particular unit and contacts with men from other units was at a minimum.

Unit C at Camp Sampson was the training area designated for the ultra-violet study. No other control measures such as sulfadiazine prophylaxis were employed in this area. In this unit the barracks were distributed in two groups of eleven buildings at either end of the drill field. Ultra-violet lights of relatively low intensity were installed in alternate barracks at the south end of the drill field. The intervening barracks at this end of the field which were not equipped with lights served as the low intensity controls. At the north end of the field there was similar experimental design of lighted and control barracks but the intensity of irradiation in each barrack was higher than at the south end. These were designated as the high intensity barracks group and the high intensity controls. Of the eleven irradiated barracks five were installed throughout with high intensity and five with low intensity lights, and one barrack had low intensity lights, on the lower deck and high intensity on the upper. For purposes of analysis the barracks groups and the contained recruit companies were divided into four epidemiological units of five and one half barracks, or eleven companies each. These were designated high intensity irradiated, high intensity control, low intensity irradiated, and low intensity control. Companies formed from incoming drafts moved into these groups in orderly sequence as graduation of companies into outgoing units took place after 4 to 6 weeks in training. This process made for a constant overturn of the study populations.

The barracks were wooden structures consisting of a large dormitory sleeping quarters on each floor with washroom and toilet facilities. Two rows of double decker wooden bunks were ranged down each side of these dormitories. The bunks were separated by a central aisle, and at the center of the room was a cleared space with tables and chairs and separated from the bunks by a row of clothes lockers.

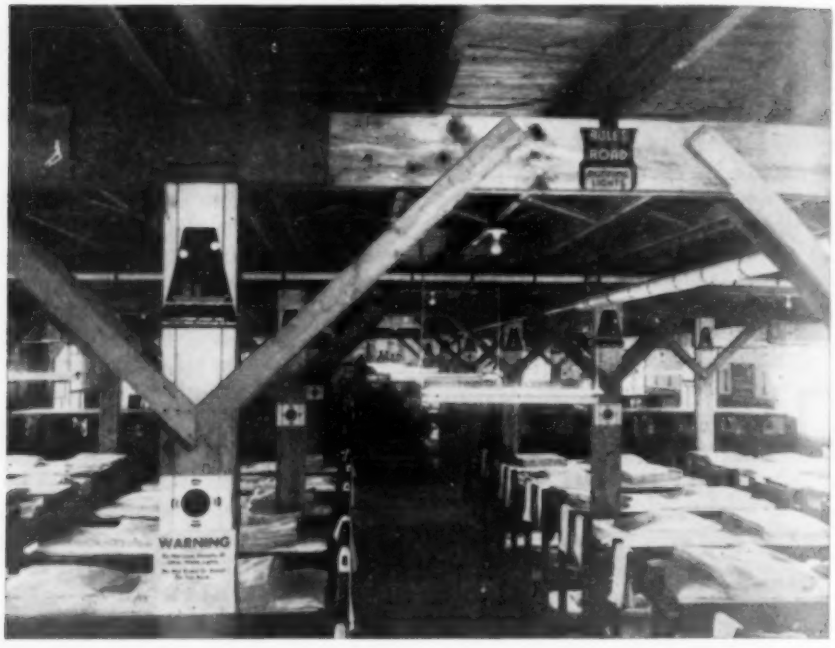
Ultra-violet lights were installed at similar locations in all the lighted barracks. Suspended overhead fixtures provided indirect irradiation directed to the upper air of the barracks. Similar ceiling fixtures were installed in the washrooms. Lights were also installed under the bunks with irradiation directed downward to the floors to achieve a maximum of bactericidal effect on the floors and lower air where bacteria laden dust particles are found to be the most numerous (Figure 2).

More detailed information on the physical aspects of the ultra-violet installation are as follows:

The ceiling lamps were installed 7′ 9″ from the deck in such a way that only the upper third of the room was irradiated. At the high intensity side 21 ceiling lamps of 30 watts were used per room, supplying about 133,500 milliwatts. At the low intensity side each barrack room had 42 lamps of 15 watts, giving about 75,000 milliwatts per room (ceiling).

For deck irradiation 26 (15 watt) under-bunk lamps were used in the high and low intensity barracks, supplying at the high intensity side 78,000 milliwatts, and at the low

FIGURE 2



intensity side 46,000 milliwatts per floor. Besides these fixtures in the main barracks, heads and showers were equipped with ceiling lights 5 (30 watt) lamps at the high intensity and 9 (15 watt) lamps at the low intensity side). The current used by these lamps is relatively low, very similar to the amount of current used by fluorescent lamps. Bunk lights were installed in such a manner that no direct radiation could be seen by the men sitting on adjacent or other lower bunks. Since only every second bunk was equipped with a lamp, the reflectors threw the light over an area covering the deck under two bunks. The deck of the barracks was virtually covered by a heavy blanket of ultra-violet radiation.

The intensity of scattered ultra-violet radiation was on the average not higher than the levels set by the Council of Physical Therapy of the American Medical Association, and practically no complaints were received of detrimental effect on the eyes. The amount of visible light given out by these lamps was low enough so that there was no difficulty encountered when sleeping under these lamps. The light appeared to the people in the barracks similar to bright moonlight.

When the lamps were first started a certain amount of ozone was produced by them. However, the lamps were burned for not less than fifty hours when men were not present in the barracks. After this time only a very little ozone could be detected, depending on the atmospheric conditions. The amount of breakage of the lamps was small and probably could be entirely avoided by the proper construction of under-bunk lamp fixtures.

The organization of medical services in these recruit units was well adapted for an accurate analysis of respiratory morbidity. All men complaining of illness were seen by the staff of the unit dispensary who administered treatment and arranged for admission to the sick bay or the Naval Hospital if the fever or other symptoms seemed to warrant it. Minor ailments were diagnosed, treated, and returned to duty, but there was no provision for illness requiring bed rest other than admission to the sick bay or hospital.

During the period of observation the names of all recruits in the ultra-violet study area were recorded on individual

cards along with other pertinent epidemiological data. These cards were kept on file in the dispensary and information as to all visits to the sick call and admissions to the sick bay or hospital was recorded on them. Since all illness whether mild or serious was first seen at the dispensary, and since a complete card file was kept on all recruits whether or not they became sick, these card files gave information as to the total population as well as the number and kind of respiratory illnesses occurring within this population. When respiratory diseases were admitted, further information as to the course of the illness was derived from the clinical records. In addition to being seen by the ward medical officer, every admission for respiratory disease was visited and examined by one of the medical officers of the epidemiology unit who made a throat culture to determine the presence of group A streptococci or of meningococci.

In addition to throat cultures on all admissions for respiratory illness there were weekly throat culture surveys of representative samples of recruits from the various barracks and periodic culturing of the men with minor respiratory complaints in the sick call line. Further laboratory work in connection with this study consisted in bacterial counts of air samples from the air of irradiated and control barracks and in the culturing of dust samples collected from dry sweepings.

RESULTS

The total number of admissions for respiratory illness by principal diagnoses and average number of men per 1,000 admitted during their period of training can be seen in Table 1. In this study admission signifies hospitalization for at least 24 hours. The greatest difference in rates for all these respiratory infections can be seen to occur between lighted and control barracks of the high intensity groups.

The commonest diagnosis in this series is " catarrhal fever," which represents in Navy terminology any febrile upper respiratory infection not specifically localized and without distinguishing diagnostic criteria such as rash or tonsillar exudate. It is also apparent from this table that specific bacterial infections such as scarlet fever and meningococcus meningitis, or specific virus diseases such as German measles were relatively scarce both in irradiated and control barracks during the months of observation in the winter and spring of 1943–1944.

This scarcity of streptococcal illness was reflected in low carrier rates for

TABLE 1

Respiratory Admissions in Irradiated and Control Groups of Barracks Unit "C" Camp Sampson, N. Y., December 15, 1943–June 1, 1944 Rates Expressed as the Number of Recruits per 1,000 Admitted During the Period of Training (Average 4.7 Weeks)

	High Intensity Barracks Group				*Low Intensity Barracks Group*			
	Irradiated		*Control*		*Irradiated*		*Control*	
Diagnosis	*Cases*	*Rate*	*Cases*	*Rate*	*Cases*	*Rate*	*Cases*	*Rate*
Catarrhal Fever	398	70.4	539	91.6	443	81.5	434	76.0
Streptococcal Infections	79	14.0	92	15.8	93	17.1	95	16.6
German Measles	11	1.9	6	1.0	5	0.9	8	1.4
Meningococcus Meningitis	1	0.2	3	0.5	2	0.4	1	0.2
All Other Respiratory Infections	23	4.1	32	5.4	20	3.7	23	4.0
Total Respiratory Admissions	512	90.4	672	114.3	563	103.6	561	98.1

TABLE 2

Results of Throat Cultures for Group A Hemolytic Streptococci in Weekly Surveys of Samples of Barracks Populations and All Admissions for Respiratory Disease from Irradiated and Control Barracks

	High Intensity Group				Low Intensity Group			
	Irradiated		Control		Irradiated		Control	
Culture Group	No. of Cultures	No. Pos.	No. of Cultures	No. Pos.	No. of Cultures	No. Pos.	No. of Cultures	No. Pos.
Weekly Surveys Barracks Populations	659	3.8%	642	3.7%	655	2.1%	634	3.2%
Admissions for Respiratory Illness	512	5.9%	672	5.7%	563	5.7%	561	5.6%

the Group A hemolytic streptococcus both in samples of the normal recruit population and among admissions for respiratory disease (Table 2). It is also apparent from this table that carrier rates at this low level were not further lowered among recruits in irradiated barracks.

The rates for total respiratory admissions in the various groups represented in time series by calendar fortnights can be seen in Figures 3 and 4. For the high intensity groups the difference in rates is obviously greatest in the first two months of the study. During this period the reduction was in excess of 35 per cent. At this time the incidence of respiratory disease throughout the camp was still at a relatively high level following the influenza epidemic of November and December, 1943. In Figure 4 such differences in

FIGURE 3

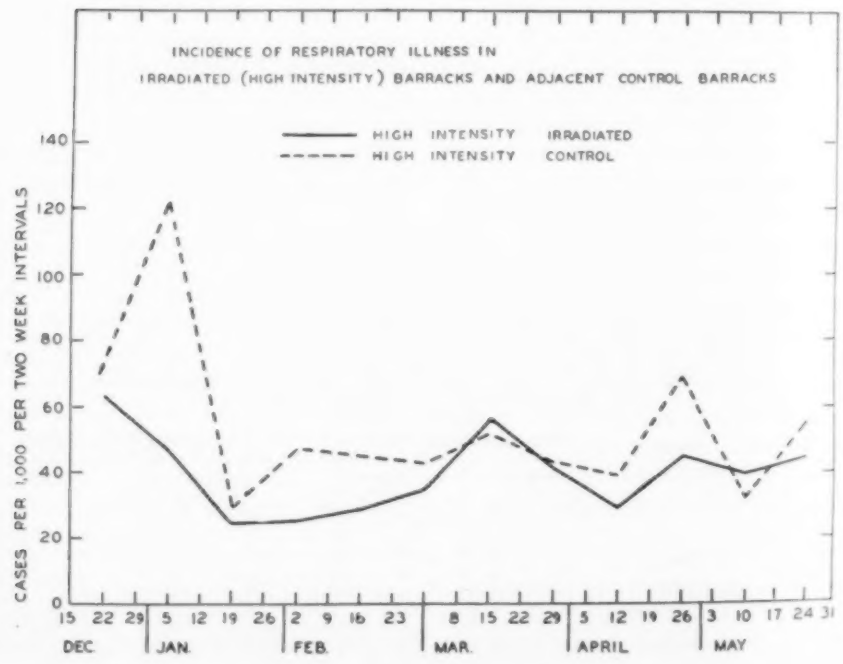
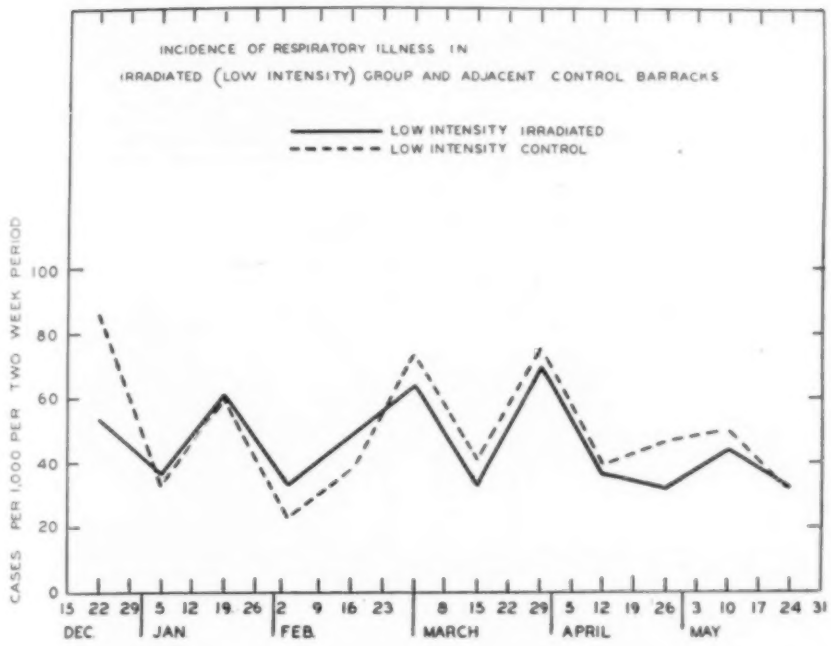


FIGURE 4



rates in the low intensity group between irradiated and non-irradiated barracks would seem likely to lie well within the limits of chance variation.

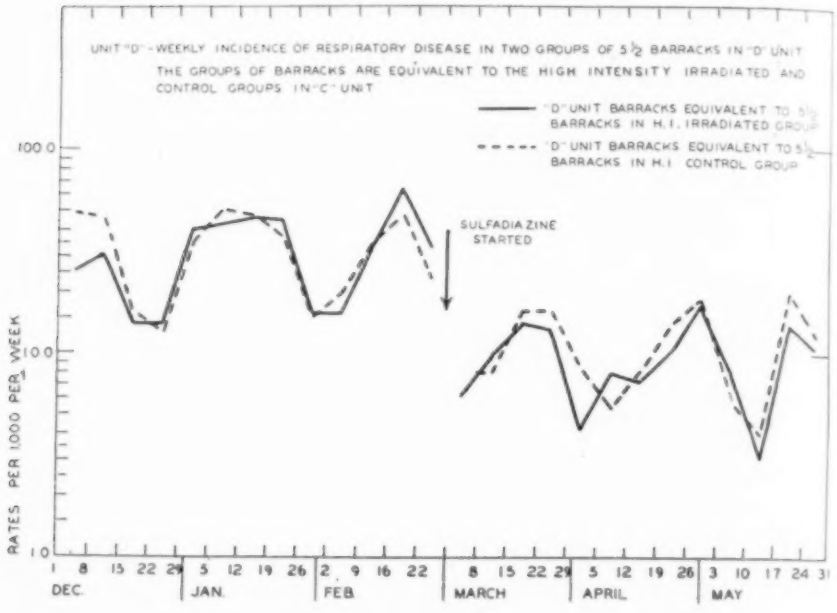
The striking similarity of the morbidity curves for low intensity irradiated and control groups affords an unexpected additional control to the results as found in the high intensity barracks. The marked difference in curves between the high intensity and its control group suggests that the dissimilarity is due to ultra-violet irradiation at an effective intensity.

Figure 4, showing the rates for the low intensity groups on a weekly basis shows a succession of peaks and dips in the morbidity curve which occur regularly at intervals of about 5 weeks. This phenomenon was observed generally throughout the camp when weekly rates were computed for similar groups in other units of barracks (Figure 5). The undulations here can be seen to have persisted even after the total rates were markedly reduced by sulfadiazine prophylaxis. An exception to this finding can be seen in a graph of the high intensity group of barracks where the regular undulations seem to have been abolished.

Study of this phenomenon suggested that it was a function of the orderly sequence of replacements through incoming companies occupying quarters in successive barracks vacated by graduations. As will be shown, the risk of infection is greatest in the middle weeks of training and that group of barracks with a majority of its occupants at this stage of training would show highest rates at this time. Similarly, lowest rates would occur when most of the recruits in the given segment of eleven barracks were at either the beginning or end of their training period.

This hypothesis was confirmed by a study of illness rates among recruits by number of weeks in training. In Figure

FIGURE 5


UNIT "D" - WEEKLY INCIDENCE OF RESPIRATORY DISEASE IN TWO GROUPS OF 5½ BARRACKS IN "D" UNIT
THE GROUPS OF BARRACKS ARE EQUIVALENT TO THE HIGH INTENSITY IRRADIATED AND
CONTROL GROUPS IN "C" UNIT
"D" UNIT BARRACKS EQUIVALENT TO 5½ BARRACKS IN H.I. IRRADIATED GROUP
"D" UNIT BARRACKS EQUIVALENT TO 5½ BARRACKS IN H.I. CONTROL GROUP
SULFADIAZINE STARTED
RATES PER 1,000 PER WEEK
100.0
10.0
1 8 15 22 29 5 12 19 26 2 9 16 22 8 15 22 29 5 12 19 26 3 10 17 24 31
DEC. JAN. FEB. MARCH APRIL MAY

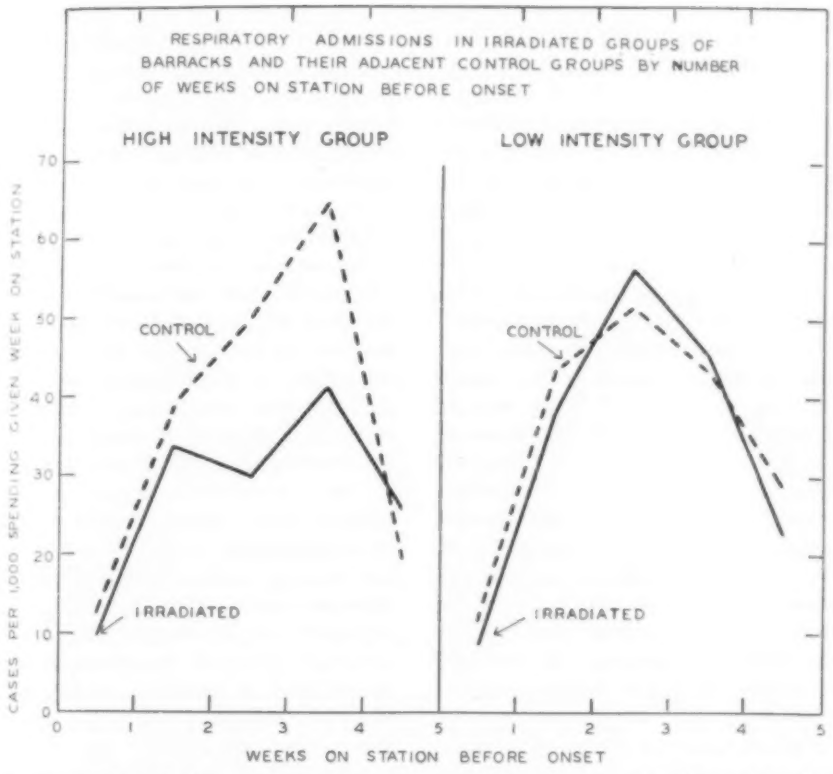
6 it can be seen that the rise and fall of incidence by weeks in training in the low intensity irradiated and control was nearly symmetrical with a peak in the third week. The curve for the high intensity irradiated barracks, however, is truncated and indicates the reason why this group fails to show the regular succession of peaks when rates are charted by calendar weeks.

In assessing the statistical significance of the differences in morbidity between the irradiated and control groups, consideration should be given to variations in disease incidence within units of the groups themselves. In this instance the company (comprising 112 men and occupying one floor of a barrack) was chosen as the basic epidemiologic unit. For each group of five and one-half barracks, irradiated or control, the average number of men per company admitted to the sick list for respiratory infections was computed. For each series of companies in the barracks groups the standard deviation about the average was calculated. The usual formulas were employed to estimate the likelihood of the differences observed in average rates for each group being due to chance.

This type of calculation was performed for all companies which were under observation 27 or more days during the course of the experiment. This requirement excludes a number of companies at the beginning or end of the experiment, but the exclusions are essentially equally divided among the groups. The number of admissions for each company was adjusted to the number of days' experience of the high intensity control group of companies, a figure slightly less than the average for all companies (Table 3).

By this method it appears justifiable to conclude that the 25 per cent reduction for the entire period of observation in respiratory illness observed in the high intensity irradiated group as compared with its control group or with the two control groups combined is prob-

FIGURE 6


RESPIRATORY ADMISSIONS IN IRRADIATED GROUPS OF BARRACKS AND THEIR ADJACENT CONTROL GROUPS BY NUMBER OF WEEKS ON STATION BEFORE ONSET
HIGH INTENSITY GROUP
LOW INTENSITY GROUP
CASES PER 1,000 SPENDING GIVEN WEEK ON STATION
CONTROL
IRRADIATED
CONTROL
IRRADIATED
WEEKS ON STATION BEFORE ONSET

ably due to irradiation and not due to chance. It is also obvious that the differences between the low intensity irradiated group and its control are such as could easily arise by chance alone. Further calculations not shown on Table 3 show a significant deviation between the high intensity irradiated and low intensity control. All other combinations of groups were found to be within the limits of chance variation.

TABLE 3

Mean Number of Admissions for Respiratory Illness per Company in Irradiated and Control Groups of Barracks, Significance of Difference Between Means for Irradiated and Control Groups

Company and Barracks Group	*No. of Companies in Group* *	*Mean No. of Admissions per Company* †	*Standard Error of Mean*	*x/σ*	*Probability of Occurrence by Chance Alone*
High Intensity Control	47	12.4	0.85	2.9	4 in 1,000
High Intensity Irradiated	46	9.3	0.64		
Low Intensity Control	47	11.4	0.59	0.1	1 in 2
Low Intensity Irradiated	45	11.3	0.77		
Low and High Intensity Control	94	11.9	0.50	3.2	1 in 1,000
High Intensity Irradiated	46	9.3	0.64		

* Includes only companies with 27 or more days' exposure during period of observation.
† Adjusted to 32.1 days' company experience.

Four surveys were conducted during the winter and spring on the bacteria of the air of irradiated and non-irradiated barracks. In these surveys extensive use was made of the open blood agar plate exposed at different levels from the floor. Also, more quantitative devices operating on the impingement or bubbler principle were used for estimates of the number of bacteria found in a given volume of air.

Total saprophyte counts in these surveys of air bacteria were consistently lower in the irradiated barracks compared to their controls. The overall reduction in these test units was 50 per cent or greater than the controls. The greatest reduction of bacterial colony counts was found under high intensity sources. A very definite and marked correlation was also found to exist in both irradiated and control barracks between bacterial counts and proximity of the exposed plates to the floor strongly suggesting the relationship of the number of bacteria isolated from the air and its dust content.

A small series of blood agar plates with gentian violet 1/500,000 incorporated were exposed for periods of 5 hours to determine the presence of hemolytic streptococci in the air. Samples of dust were also collected from the floors of irradiated and non-irradiated barracks, and cultured for the presence of beta hemolytic streptococci.

The number of these tests for hemolytic streptococci in the air was too small for the assessment of statistical significance but streptococci were found consistently and were relatively numerous in the air and dust of the control barracks, whereas streptococcal colonies were found infrequently and in small numbers from either dust or air of the irradiated quarters.

COMMENT

The type and location of ultra-violet sources were determined on the basis of the greatest expected measure of control in the exposed populations. For reasons already mentioned, sleeping quarters were chosen as the site of the installations. Within these quarters a combination of upper air and floor irradiation was employed. Irradiation of the lower air and floor was considered important because of many recent reports implicating the infected dust particle and lint as vehicles in the spread of respiratory infection. Direct observations have shown that dust and lint often carry pathogenic organisms and also that as the dust content of room air increases it is accompanied by a corresponding increase in the number of bacteria found in air samples. Whether dust particles stirred into the air by momentary turbulence created by bed making and other activities or whether organisms floating freely for indeterminate periods in the air of a room are of equal importance in the transmission of air-borne contagion, is not yet established. For this reason the present installation was directed both to the irradiation of dust in the lower air and on the floor and also to the more hypothetical droplet nuclei of the upper air of the sleeping quarters by overhead irradiation.

In this experiment the level of ultra-violet intensity seems to have been an important determining factor as to whether or not air-borne infections were effectively controlled. It is interesting that even in the low intensity barracks 121 watts of ultra-violet energy were produced in each dormitory, which is high for the volume of air irradiated in comparison with previously reported figures in other studies on the effect of ultra-violet light. Lurie (1944), in his recent experiments on the spread of tuberculosis in rabbit colonies, found that it was necessary to increase the intensity of ultra-violet barriers in order effectively to interrupt the spread

of this infection in a controlled environment.

One of the many questions as yet unanswered in the present study is whether an even higher intensity of ultra-violet energy would have increased the effect on the spread of respiratory illness in the barracks. A moderate increase in the number of fixtures and total intensity furnished is planned for studies in the coming winter and may help to elucidate this question.

The slightly greater intensity of irradiation from lamps which are new may have been the cause of the markedly greater percentage reduction of respiratory illness in the high intensity group in the first 2½ months of the study than in its later stages. On the other hand, differences in the nature and amount of illness in the early and later stages of the study may account for the apparent difference in the effect of the ultra-violet sources. By this hypothesis ultra-violet irradiation is most effective in times of high disease incidence such as occurred at Camp Sampson in December, 1943, and January, 1944, during the later stages of the influenza epidemic. This is because under epidemic conditions air-borne spread is considered to be an important factor. When disease rates drop below a certain minimum, infection is contracted by contact at close range with relatively greater frequency. Such a method of spread would not lend itself to control by ultra-violet sterilization of the air. The low rates encountered in the latter months of the study in the spring of 1944 may have represented an irreducible minimum as far as control through ultra-violet irradiation is concerned.

The unusually low illness rates in Unit " c " at Camp Sampson during the period of observation is revealed by comparison with similarly computed rates at the Naval Training Station, Newport, R. I., in 1940 and 1941 (Table 4).

In comparison with Newport the most notable lack of morbidity at Sampson can be seen to exist in German measles and streptococcal infections. This may have been due in part at Camp Sampson to the relatively short training period which averaged less than 5 weeks. This would serve to limit the amount of streptococcal illness which has been observed in other naval training stations to reach its peak of incidence from 6 to 8 weeks after the onset of training. It would also tend

TABLE 4

Respiratory Disease Among Naval Recruits
" C " Unit, Camp Sampson, N. Y., December 15, 1943–June 1, 1944
Compared with
Naval Training Station, Newport, R. I., November 1, 1940–July 1, 1941
Average Weekly Admissions per 1,000 During Training Period

	N.T.S., Newport, R.I. 1940–41		Unit " C," Sampson, N. Y. 1943–44		
Diagnosis	*Cases*	*Rate per 1,000 per Week*	*Cases*	*Rate per 1,000 per Week*	*Ratio of Rates, Newport to Sampson*
Catarrhal Fever Group	2,098	26.2	1,875	17.6	1.5 : 1
German Measles	355	4.7	38	0.36	13.0 : 1
Acute Streptococcal Infections:					
Scarlet Fever	175	2.3	6	0.06	38.3 : 1
Other Strept. Infections *	418	6.4	128	1.2	5.3 : 1
Total Respiratory Disease	3,111	39.6	2,047	19.2	2.1 : 1

* Predominantly tonsillitis and pharyngitis, by clinical diagnosis; not necessarily confirmed by throat cultures.

to prevent the appearance of many cases of contagious diseases, such as German measles, which have relatively long periods of incubation. In the coming winter training will be lengthened to about 10 weeks. This decreases the rate of overturn but may give a greater opportunity for these specific bacterial and virus diseases to develop during the period of recruit training. If such is the case a more definite assessment of the effect of ultra-violet irradiation will be possible.

SUMMARY

Ultra-violet irradiation of the floors and upper air of barracks housing naval recruits was accompanied by a 25 per cent reduction of respiratory illness in those barracks equipped with high intensity sources (235 watts of ultra-violet energy per dormitory sleeping quarters for 112 men) as compared with illness in the adjacent control barracks.

This effect was most noticeable in the early winter months when illness rates were at a generally high level throughout the camp. At this time the reduction of incidence in barracks irradiated with high intensity sources as compared to the controls was approximately 35 per cent.

Streptococcal illness and carrier rates were at a very low level. These low levels were not further reduced among men living in irradiated barracks.

Bacterial counts from air samples in irradiated barracks showed a definite reduction (50 per cent) in total saprophyte colony counts as compared with counts from non-irradiated control barracks.

Beta hemolytic streptococci isolated from air and dust were found more frequently and in greater numbers in control barracks than from irradiated sleeping quarters.

In view of the fact that reduction in morbidity rates was marked in the high intensity irradiated group only in the first months of the study period, the results of the experiment of 1943–1944 should be interpreted with caution. The final assessment of the limits of effectiveness of ultra-violet irradiation in barracks must await further observations during the coming winter of 1944–1945.

NOTE: The authors wish to express thanks and appreciation to Commodore H. A. Badt, U.S.N., commander of the United States Naval Training Center, Sampson, N. Y., whose aid and support made it possible to carry out this study, and to Captain T. A. Fortescue, (MC) U.S.N., Senior Medical Officer of the Training Center, who provided generously of all facilities and coöperated actively in the conduct of the project. The authors also acknowledge the generous coöperation and interest of the Preventive Medicine Division of the Bureau of Medicine and Surgery in the conduct of this investigation.

Tuberculosis in the Armed Forces*

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MOBILIZATION began shortly after proclamation of an unlimited national emergency in May, 1940. The system of Selective Service for induction into the Army was established in September, 1940, and voluntary enlistment in the Army and Navy was rapidly accelerated. Army and Navy Reserve officers were called to active duty and the National Guard was called into federal service.

A physical examination was required of every man prior to acceptance for military duty. Both Army and Navy set rigid standards to exclude men unable to stand the physical strain and other exigencies of service. Disease and abnormality likely to impair efficiency or lead to disability precluded acceptance. Among the diseases requiring rejection was tuberculosis.

The Army had had an unfortunate experience with tuberculosis in World War I, when many thousands of tuberculous soldiers were unwittingly inducted into service because of inadequate methods of detecting the disease. Every effort was made to exclude tuberculosis at that time by the best method available, viz., physical examination, with emphasis on auscultation and searching examination for post-tussic rales. Roentgenography was not sufficiently developed to be widely used, or good enough to detect the majority of cases of minimal tuberculosis.

The lessons of World War I were well known when mobilization for World War II began. Prompt effort was made to capitalize on the knowledge. It was clear to the Medical Corps of the Army that x-ray examination should be used routinely to exclude tuberculosis. X-ray photography had been highly developed in the intervening quarter of a century, and the mass survey method for detection of pulmonary tuberculosis had become commonplace.

In spite of this knowledge, however, x-ray examination was not universal when mobilization began. Speed in raising troops was essential and the number to be called was large. In the Army early decentralization of command was ordered for the sake of efficient operation. The general method of induction in all corps areas (later service commands) was the same, and identical standards of physical examination were followed in induction, but there was sufficient autonomy in detail so that variation in procedure, including induction physical examination, occurred. In the first three corps areas, comprising the states along the north and central Atlantic seaboard, x-ray examination was made obligatory from the outset for men inducted through the Selective Service System. In the

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remaining six corps areas, however, x-ray examination of Selective Service registrants was far from universal at first. For many months, moreover, men were accepted for voluntary enlistment on the traditional basis in which x-ray examination was used only when special circumstances made it appear desirable. Steadily, however, the proportion of Selective Service registrants who were x-rayed before induction rose. Officers called to active duty and all applicants for commission throughout the country were x-rayed. X-ray examination finally became universal in the spring of 1942, but only after approximately one million men had been admitted without x-ray examination.

In the Navy the photofluorographic mass method of examining the chests of recruits was inaugurated in January, 1941. Its use spread rapidly through the Naval Training Stations during 1941, and in January, 1942, a general order was issued requiring roentgenographic examination of all Navy and Marine Corps personnel as part of the physical examination to determine physical fitness for appointment, enlistment, or call to active duty.*

In the Army a variety of methods was used. In the early months of mobilization x-ray films of whatever type was most convenient and practical were used. Full size celluloid and paper films were employed in the great majority of cases. Later, with the rapid development of equipment and improvement of procedure, photoroentgenography with its speed, convenience of processing, and attendant filing economy, became standard. Four by five inch films, later changed to four by ten inch stereoscopic films, were chosen for routine work.

* For data with respect to tuberculosis control measures in the Navy, when direct citation of reference is not made, the authors are indebted to the Preventive Medicine Division, Bureau of Medicine and Surgery, U. S. Navy.

STANDARDS

The objective of physical standards in both Army and Navy as far as tuberculosis was concerned, was to exclude all active disease and inactive disease that might be reactivated under strain of military duty. Standards based on x-ray examination were not included in the regulations for acceptance of enlisted men prior to mobilization, and it was necessary to draw them up *de novo*. In the preparation of these standards advice was obtained from a Subcommittee on Tuberculosis set up within the Division of Medical Sciences of the National Research Council. Early editions of mobilization regulations in the Army defined the limits of acceptable arrested primary tuberculous lesions closely, an action that was necessary at a time when approximately a hundred induction stations were pioneering in a process in which rapidity of action and decision were paramount. Subsequently, with greater familiarity with procedure and improvement in skill on the part of induction station examiners, limits in size and character of lesions were set less arbitrarily, and at the same time there was extensive reëxamination of men rejected under the earlier rigid standards. Current standards leave much to the judgment of induction station roentgenologists with respect to arrested primary lesions, while continuing the provisions, with added emphasis, on the exclusion of infiltrative lesions of questionable activity. The following paragraphs quoted from the current edition of *Mobilization Regulations* (War Department, April 19, 1944) indicate the limits of acceptability of latent tuberculous lesions:

"87. General Service.—*a*. Calcified residuals of primary tuberculosis in the pulmonary parenchyma or hilum lymph nodes, provided the size, number, and character of such lesions are not such as to suggest the possibility of reactivation. Well calcified masses in adult white subjects usually represent entirely

healed lesions. Partially calcified and therefore presumably partially caseous masses in younger subjects, particularly in persons of other than the white race, are potentially hazardous. Clinical judgment is important in rendering a decision. In those cases in which a decision cannot be made on roentgenological grounds alone, it is essential that a careful examination be made by an examiner with special experience in tuberculosis, taking into account the age of the subject, history, and the possible presence of nonpulmonary tuberculosis . . .

"g. The following conditions are temporarily disqualifying: . . .

"(5) Scarred fibroid or fibrocalcific infiltrative tuberculous lesions of the lungs represented in roentgenograms as *sharply demarcated, strand-like or well defined, small, nodular shadows not exceeding a total area of 5 square cm.* may be accepted after deferment until subsequent examination clearly demonstrates that the lesion is stationary and not likely to be reactivated. The minimum period of time to determine this is 6 months. It must be recognized that either progression or regression of the lesion indicates instability. Clinical judgment, taking into consideration other factors, including age and race, must be exercised in estimating the likelihood of reactivation. Experience indicates a greater likelihood of reactivation of an apparently stable lesion in persons under 25 years of age than in older persons.

"59. Nonacceptable.—*a.* Tuberculosis of the lungs or tracheobronchial lymph nodes except as defined in paragraphs 57*a* and *g*(5). Small infiltrative tuberculous lesions, unless of *sharply defined linear or nodular appearance on roentgenograms,* as described in paragraph 57*g*(5), are disqualifying even though involving a total area of less than 5 square cm. and apparently stable over a period of 6 months.

"*b.* Fibrinous or serofibrinous tuberculous pleurisy, and serofibrinous pleurisy of unknown origin. Inasmuch as pleurisy, with or without effusion, is a frequent manifestation of active tuberculosis, all persons who have apparently recovered from pleurisy will be examined with the greatest care. Authenticated history of pleural effusion of unknown origin within the last 5 years; chronic fibrous pleurisy sufficient to cause marked retraction of the chest wall and of the mediastinum or to cause a density in the roentgenogram which completely obscures a considerable section of the pulmonary fields."

In the Navy causes for rejection for original entry into the service, as well as for hospitalization for further study, treatment, and disposition following subsequent examinations, are established as follows (*Bu. Med. Letter,* 13 June, 1944, to All Ships and Stations):

(a) Any evidence of re-infection (adult) type tuberculosis, active or inactive, other than slight thickening of the apical pleura or thin solitary fibroid strands.

(b) Evidence of active primary (childhood type) tuberculosis.

(c) Extensive multiple calcification in the lung, parenchyma, or massive calcification in the hilus, or any calcification of questionable stability.

(d) Evidence of fibrous or sero-fibrinous pleuritis, except moderate diaphragmatic adhesions with or without blunting or obliteration of the costo-phrenic sinus.

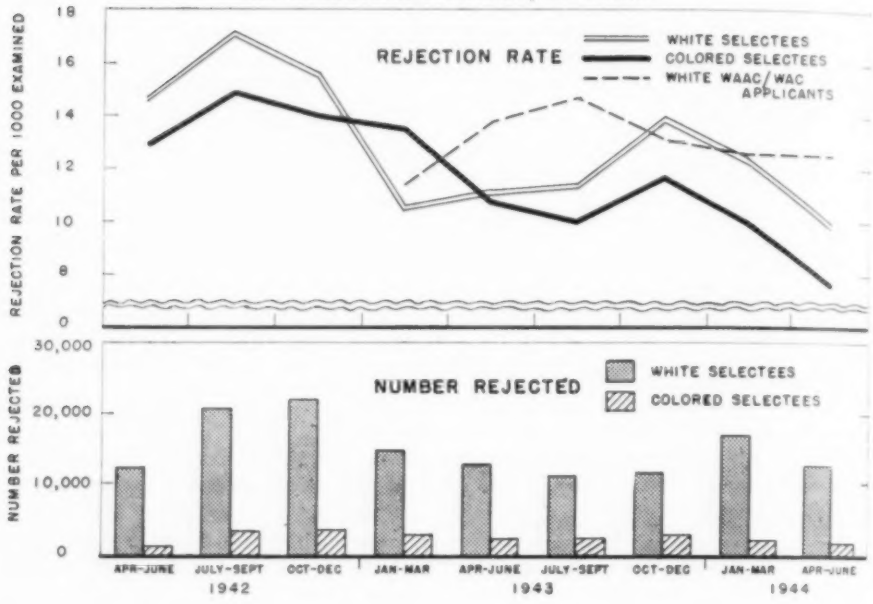
(e) Other disqualifying defects demonstrable by a roentgen examination of the chest.

Since men who are accepted will ultimately have the status of veterans, arrangements were made by the Army at the beginning of mobilization for filing films of accepted men in the Veterans Administration. This was particularly appropriate in view of the fact that from the very outset it was contemplated that every soldier would have a chest x-ray examination on discharge, a system permitting comparison of entrance and separation films, and providing for objective determination of acquisition or aggravation of lesions in service. Films of accepted Navy personnel have been filed with individual medical records in the Navy Department.

The million of films that have been forwarded to the Veterans Administration from induction stations, together with the proportionately smaller but already numerically large stream from points of discharge, have made the Veterans Administration file an enormous assemblage. Some twenty million x-ray examinations have been made of men and women in the course of preinduction, induction, enlistment, and officer candidate school examinations.

FIGURE 1

TREND OF REJECTIONS FOR PULMONARY TUBERCULOSIS AT INDUCTION STATIONS, BY COLOR



REJECTION RATES

Approximately 150,000 men have been rejected at armed forces induction stations because of pulmonary tuberculosis. Figure 1 indicates the number of men reported as rejected for pulmonary tuberculosis, and the resulting rejection rate for selectees at induction stations, as well as the corresponding rate for applicants for enlistment in the Women's Army Corps.* The figure does not take into account the rejections by local boards, which preceded those at induction stations. These amounted to 1 to 2 men per 1,000 examined. It will be noted that the rate of rejection was high in 1942, low in the first three quarters of 1943, high in the last quarter, and low in 1944. The high figure for 1942 represents rapidly increasing use of roentgenography in the induction stations, and high standards, with rejection of many men for calcified primary tuberculous lesions that were later considered acceptable.

The decline in the rejection rate during the latter part of 1942 may be attributed to the liberalization of standards in the Army, permitting acceptance of men with large healed primary lesions, a liberalization put in effect with certain specified safeguards. The sharp drop early in 1943 also reflects a notable lowering of the average age of men called for examination, as is indicated by the fact that in the early months of 1943 about 40 per cent of the selectees examined were under 20

* The number of men reported as rejected for pulmonary tuberculosis and the corresponding rejection rates understate somewhat the actual incidence of pulmonary tuberculosis found at induction stations to the extent that cases presenting serious disqualifying defects in addition to tuberculosis were sometimes reported as rejected for causes other than tuberculosis; the resulting understatement has been variously estimated as being in the range from 10 to 15 per cent.

years of age as a result of new legislation which made such men available to the Army for the first time in December, 1942. The rise in rejection rate in the latter part of 1943 is in large part fictitious, being due in considerable measure to reworking of the lists of men previously rejected, in the effort of the Selective Service System to fill required quotas. The current low rate of rejection corresponds to induction of a group of young married men, relatively few of whom apparently are tuberculous.

In passing it is to be noted that the rate of rejection for Negroes is lower than that for whites and that the rate for women volunteering for enlistment in the Women's Army Corps is higher than that for men. A critical analysis of the effect of race and age on the prevalence rate of tuberculosis among selectees, indicating relatively high rates for men in the upper age brackets, has been made by Karpinos.[1] In this connection it should be noted that the relatively low incidence of tuberculosis among selectees reflects the findings for a group with a very young age distribution. Numerous reported analyses of the experience of individual induction stations, and comparisons with British and Canadian figures, have been reviewed by Freer.[2]

The follow-up of rejections is one that has varied greatly with the interest and initiative of individual communities. The routine procedure at induction stations is to report each man rejected to state Selective Service System Headquarters, to which originally was tacitly left the responsibility of making proper report to state health authorities. Obviously, with nothing mandatory, this system was not highly effective. Arrangements for proper reporting were later effected through conferences in the National Headquarters of the Selective Service System, at which the Army, Navy, and U. S. Public Health Service were represented.[3] In the meantime, local cooperation was in effect in many states and communities. In New York City, for example, the Bureau of Tuberculosis of the City Department of Health received notice every evening of men rejected at the New York City induction station on that day, a station that at times examined as many as 4,000 men daily. In many large states report to state health authorities, if not quite as rapid, was practically as efficient.

It has been evident even recently, however, that reporting is not universal, and an Army Regulation requiring reporting of communicable diseases, which applies to men rejected from enrollment as well as those acquiring disease in the Army, has been strengthened and reëstablished as pertaining to tuberculosis as well as other communicable diseases. This regulation (*War Department Circular No. 313*, 24 July, 1944, Section III) reads in part as follows:

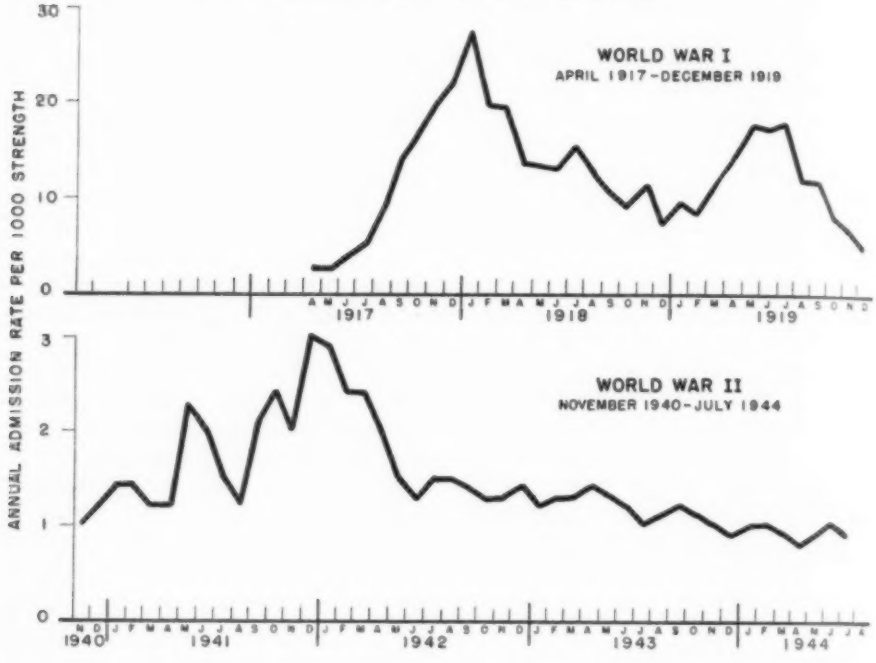
". . . tuberculosis is a reportable disease in all states and falls within the provisions of paragraph 44, AR 40-1080, 10 December, 1943. Therefore, at the time of discharge from the Army, all cases of tuberculosis will be reported as prescribed in AR 40-1080, including those to be transferred to a veterans' facility. The report will include sufficient identifying data so that public health officials may readily locate the individual upon his return to his home or other designated place. The full name, age, marital status, and prospective street address, if known, will be included. The report will also indicate the form of tuberculosis (e.g., pulmonary, renal), whether active or inactive, and whether or not the sputum contains tubercle bacilli. If the patient is to be discharged to a Veterans Administration facility, the name and address of the facility will be stated.

"2. Cases of active or probably active tuberculosis diagnosed at an induction station or other Army installation passing on physical qualifications, and rejected for military service, also come under the provisions of the regulation cited above and will be similarly reported to the state health officer by the commanding officer of the induction station or other installation."

FIGURE 2

TREND OF ADMISSION RATE FOR TUBERCULOSIS – WORLD WARS I AND II

ARMY IN THE CONTINENTAL UNITED STATES


ANNUAL ADMISSION RATE PER 1000 STRENGTH
30
20
10
0
WORLD WAR I
APRIL 1917-DECEMBER 1919
A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1917
1918
1919
3
2
1
0
WORLD WAR II
NOVEMBER 1940-JULY 1944
N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A
1940
1941
1942
1943
1944

ARMY ADMISSION RATE

The Army admission rate for tuberculosis, stated as admissions per 1,000 men per year, indicates the total number of cases of tuberculosis admitted to hospital for care or observation. It includes the active cases discovered and latent cases hospitalized for determination of activity. It is of interest to compare the rates of admission for all forms of tuberculosis * for this war with those recorded for 3 years including the period of World War I. The rate in this war has been approximately one-tenth of that in the previous one (Figure 2). The drop reflects the lowered incidence of tuberculosis in the present period and the greatly improved procedure for excluding cases at the induction physical examination. The figures given are for the Army in continental United States. A significant feature of each curve is the early rise in incidence, which is believed to reflect the imperfections of early development, when methods were immature, personnel was gaining experience, and many cases failed to be detected. The high rate represents a weeding out of cases admitted during this early period. The succession of peaks, reaching a rate of 3 per 1,000 between May, 1941, and May, 1942, probably represents in large measure the discharge of men admitted in the first rapid mobilization, when a million men were accepted without x-ray examination. The low rate after that point corresponds to a period when all men had been x-rayed before acceptance.

* Over 90 per cent of the total admissions for tuberculosis have been for pulmonary tuberculosis.

Attention is called to the second hump in the admission rate for tuberculosis in World War I. This corresponds to the summer of 1919, and represents tuberculosis discovered on discharge. A similar rise may reasonably be expected with mass demobilization and the attendant re-x-ray examination in this war.

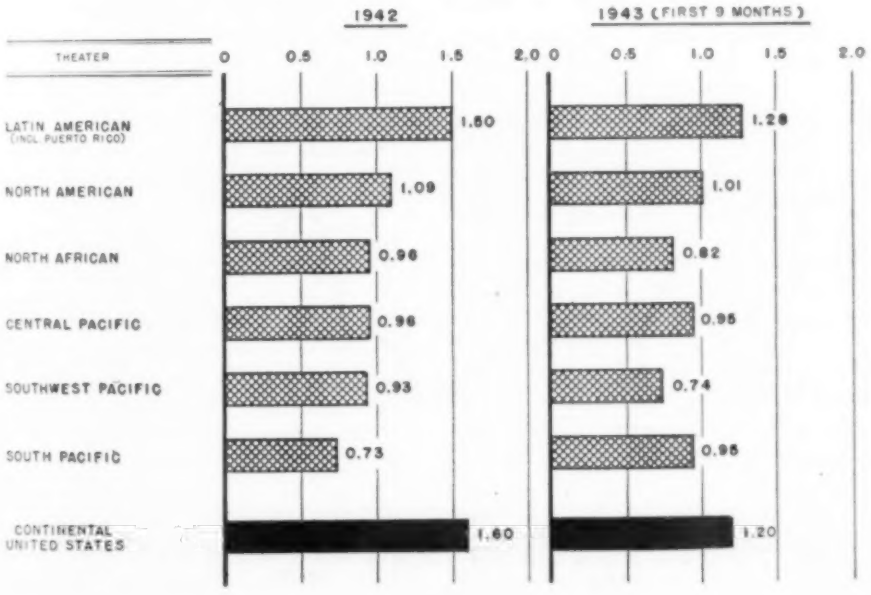
The admission rate for tuberculosis overseas has been consistently lower than that for troops in continental United States (Figure 3). The same observation was made in World War I. The rate for the European Theater of Operations is not included because comparable data are not available for that theater. The relatively low rate for most theaters is explained on the basis of the screening effected during training preliminary to going overseas. While x-ray examination is not routinely repeated, it is regularly carried out when there is any suspicion of chest disease. The Army overseas represents a selected group of men who have had months of Army experience, during which the less fit have been removed. One conspicuous exception to the low rates is in the Latin American Theater. A relatively high rate there is due to the fact that one component, the Puerto Rican group, has an incidence considerably in excess of the average for the Army. A point to be borne in mind in considering the admission rates overseas through September, 1943, is that these rates represent by and large a relatively short period of exposure to different climatic and other environmental conditions overeas.

Comparison of final chest x-ray films of men breaking down in service with their induction films has shown that in the majority of instances the disease was present and should have been de-

FIGURE 3

ADMISSIONS FOR TUBERCULOSIS, OVERSEAS THEATERS, 1942-43

ANNUAL ADMISSION RATE PER 1000 STRENGTH



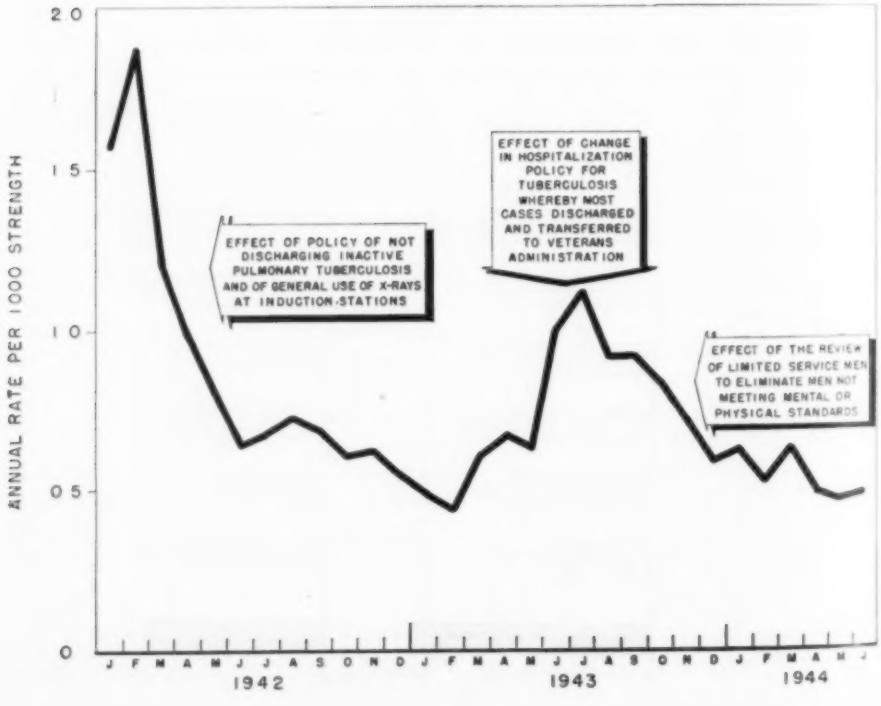
tected at the time of induction. This was anticipated as a result of a review made in the Office of The Surgeon General on men accepted at induction stations in the spring, summer, and fall of 1942.[4] This review, made on a sampling basis covering all induction stations, indicated an expectancy of later discovery of tuberculosis of approximately 15 men per 10,000. This compares closely with the actual recorded admission rate of 1 to 1.5 per 1,000 men per year, which has held since that time. The tuberculosis discovered on reëxamination of induction x-ray films varies from faint cloudiness, distinguishable only in the light of later progression, to infiltration that could have been overlooked only through gross clerical error. To the credit of present operation of induction stations it may be said that mistakes of the latter type are rare today. The errors in omission still being made are the result of high pressure work and occasional failure to note small lesions not readily discernible in the lung fields.

DISCHARGES FROM THE ARMY BECAUSE OF TUBERCULOSIS

The trend of discharge from the Army because of tuberculosis is indicated in Figure 4 for enlisted men. The rate has varied in the last 3 years from approximately 2 to 0.5 per 1,000 men per year, and has been affected markedly by changes in administrative policy on discharge. In early 1942 many men were discharged who were found not to meet the current rigid standards for induction. As previously

FIGURE 4

TREND OF DISCHARGES FOR TUBERCULOSIS
JANUARY 1942 - JUNE 1944


ANNUAL RATE PER 1000 STRENGTH
2 0
1 5
1 0
0 5
0
EFFECT OF POLICY OF NOT DISCHARGING INACTIVE PULMONARY TUBERCULOSIS AND OF GENERAL USE OF X-RAYS AT INDUCTION STATIONS
EFFECT OF CHANGE IN HOSPITALIZATION POLICY FOR TUBERCULOSIS WHEREBY MOST CASES DISCHARGED AND TRANSFERRED TO VETERANS ADMINISTRATION
EFFECT OF THE REVIEW OF LIMITED SERVICE MEN TO ELIMINATE MEN NOT MEETING MENTAL OR PHYSICAL STANDARDS
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J
1942
1943
1944

pointed out, many men had been admitted without x-ray examination and a re-study of this large group brought to light numerous cases of active tuberculosis and inactive tuberculosis of an extent not acceptable under the provisions of the current mobilization regulations. What was considered to be an unjustifiable waste of capable man power was stopped in April, 1942, when a directive (*War Department Circular No. 98*, 3 April, 1942) was promulgated, prohibiting the discharge of men with inactive tuberculosis. The effect of this directive is shown in the steep downward slope of the curve for the first half of 1942. In the summer of 1943 an order (*War Department Circular No. 109*, 26 April, 1943) was put in effect, calling for the prompt discharge of cases of tuberculosis and transfer to the Veterans Administration. Active cases, previously held in Army hospitals, were separated from the service at a rate greatly exceeding that which had prevailed for a year past. The effect of this directive is clearly shown in the figure. The rate subsided only slowly after this directive, because a new force had entered, viz., another order (*War Department Circular No. 161*, 14 July, 1943) which directed that, with certain specified exceptions, all men not meeting the prescribed minimum standards for induction would be discharged from the service.

After this last weeding out, the general policy on discharges was changed so as to retain in the Army all men below minimum standards who could effectively fill some position in the service. This operated to keep in the Army minimal apparently stabilized cases which might have been discharged previously. As a result, the discharge rate soon dropped to the current low level of approximately 0.5 per 1,000 men per year, a figure representing a discharge rate of approximately 3,500 men per year in an Army of 7,000,000 enlisted men.

A feature of practical interest is shown in figures recording the effect of age on the discharge rate (Table 1). An abrupt rise is evident after the age period 35–39. The rate for men below 20 years of age is only 0.3 per 1,000 men per year.

TABLE 1

Age	*Annual Number of Discharges for Tuberculosis per 1,000 Men*
Under 20	0.30
20–24	0.65
25–29	0.88
30–34	1.02
35–39	1.32
40 and over	2.56

TUBERCULOSIS IN THE NAVY

The Navy recorded a sharp rise in the total admission rate for tuberculosis in 1941 and 1942, after a steady decline in rate for nearly twenty years.[5, 6] The rise was attributable to improved case finding carried out by the photofluorographic method on men already in service. Since 1943 the admission rate for tuberculosis in the Navy has dropped in essentially the same manner as in the Army. The rate, which had reached 2.0 in 1941 and 3.1 in 1942, dropped abruptly to 0.66 in 1943, computed on a strength of approximately 2,000,000 men, as indicated by officially published figures. Since January, 1943, induction station examination has represented a joint operation of the Army and Navy, so that a distinction on the basis of rejection cannot be made.

Invalidings from the service in the Navy rose sharply from 0.7 per 1,000 men per year in 1940 to 1.2 in 1941 and 2.5 in 1942. The rate dropped again to 1.4 (provisional) in 1943 and 0.5 (projected) in 1944.

The Bureau of Medicine and Surgery of the Navy has recently issued an

order (*Bu. Med. Letter,* 13 June, 1944, to all Ships and Stations) that will be of far-reaching importance in the control of tuberculosis in that service. Not only is roentgenographic examination required as part of the physical examination to determine physical fitness for original entry into the service and for active duty, but such examination is required also of all Naval and Marine Corps personnel who have not been examined for twelve months. Photofluorographic equipment has been made widely available for the purpose. As in the case of Army personnel, x-ray examination is required prior to discharge or release from active duty.

DISPOSITION OF CASES IN THE ARMY AND NAVY

Reference has been made to the Army directive requiring separation of men with tuberculosis from the service as soon as this is practicable. Provision is made, however, for hospitalization of all men whose recovery might be jeopardized by immediate discharge, and for the care of these men the Army maintains large tuberculosis services, with approximately 1,750 beds, in two of its general hospitals, viz., Fitzsimons General Hospital near Denver, Colo., and Bruns General Hospital, near Santa Fe, N. M. The latter service was established specifically for the care of cases received from overseas. Approximately 120 cases a month are evacuated from foreign theaters at present. Through the operation of these large tuberculosis services the Army is able to control the rate of discharge to Veterans Administration hospitals. A principal objective in the care of tuberculous patients in Army hospitals is indoctrination on the necessity of continued care for the patient's own sake and for the protection of his family and associates after discharge to the Veterans Administration.

In the Navy, patients with tuberculosis are treated in all naval general hospitals and in a number of convalescent hospitals. Certain officer personnel, by arrangement with The Surgeon General of the Army, are treated at Fitzsimons General Hospital, Denver, Colo., and certain enlisted personnel at the U. S. Naval Hospital, Corona, Calif., and at Fitzsimons General Hospital. As in the Army, arrangements are in effect for transfer, under conditions specified in Navy regulations, to the Veterans Administration.

The Veterans Administration maintains nineteen tuberculosis hospitals and has additional beds for tuberculosis in twenty-six general hospitals. On July 21, 1944, 6,030 beds were occupied and 1,489 unoccupied. Of the occupied beds approximately 40 per cent are used by World War II veterans. Between December, 1941, and July 31, 1944, there were 9,370 admissions of World War II veterans with pulmonary tuberculosis (including readmissions, which are estimated as approximately 20 per cent). Of this number, 6,161 were adjudged service-connected and 3,209 not service-connected. Figures for the period up to March 15, 1944, indicate that 75–80 per cent of the adjudicated claims for pension for tuberculosis represent Army applicants, and the remainder former members of the Navy, Marine Corps, and Coast Guard. Of the 4,293 cases adjudicated up to that time, in which pension was allowed, 3,590 (83.6 per cent) were Army cases, 584 (13.6 per cent) Navy cases, 80 (1.9 per cent) Marine Corps cases and 39 (0.9 per cent) Coast Guard cases.

SUMMARY

1. The armed forces of the United States have attempted to exclude, in so far as possible, all cases of active or potentially active tuberculosis by chest x-ray examination prior to acceptance of men and women for military service or call to active duty. The procedure followed has resulted in a drop in the inci-

dence of tuberculosis, as determined by annual hospital admission rates, to the lowest figures on record. The rates for both Army and Navy are less than one-tenth of the average rates in the first World War.

2. Discovery and exclusion of cases of tuberculosis by x-ray examination has not been perfect, and a certain number of active cases not detected at the time of induction are later discovered. These and cases that develop without previous manifestations of tuberculosis are discharged from military service after a period of initial treatment. The annual rate of discharge from both the Army and the Navy for tuberculosis is now approximately 0.5 per 1,000 men per year.

3. Both Army and Navy require chest x-ray examination before discharge of men and women from service.

4. The discovery and rejection of cases of tuberculosis in preënlistment and pre-induction examinations, the detection of cases in the course of military service, the discovery of cases in the examination required on discharge, and the system of reporting to state health authorities, now in effect, have made the tuberculosis programs of the armed forces an outstanding contribution to the national program of tuberculosis control.

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Nutrition Foundation Grants

The Nutrition Foundation, Inc., New York, N. Y., in March announced that grants totaling $258,100 had been made covering six new research projects and twenty-four renewals of grants for studies now under way. At the same time it was announced that twenty-one areas of knowledge are represented among those in which increased basic information has resulted from the studies supported by the Foundation during the past three years.

Among the new grants made was one of $47,500 for a 5 year study of nutrition at Harvard University in relation to maternal health. The Public Health Research Institute of New York City received $10,500 for a 3 year study of the development of micro-chemical methods for evaluating nutritional status. The School of Medicine and Dentistry at the University of Rochester received $10,000 for a 2 year study of the nature and significance of a pigment associated with vitamin deficiency. Other new grants included one to the University of Pittsburgh for studies on self-selection of diets, and to Washington University for studies on the mechanism of carbohydrate reactions in animal tissues. Also a grant to the University of Wisconsin to study the characterization of compounds containing bound biotin and other vitamins.

Industrial Hygiene and Labor*

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WE have now reached the point where labor, especially the organized portion of it, has begun to realize the value and benefits resulting from industrial hygiene activities. Consequently, it is not surprising to find labor taking an active interest in our work, and viewing critically some of its phases. Under the circumstances, this attitude is reasonable enough, but it calls for elucidation. We should, therefore, review ourselves to a certain extent and from the outcome try to develop a policy which will be fair to both industry and labor. In any event, let us at least be clear on the why's and wherefore's of some of our doings.

For many years members of the industrial hygiene profession have toiled to clean up the workers' environment in industry. A look backward leads one to believe that they have done a commendable job, despite opposition, lack of numbers, and inadequate appropriations. Much still remains to be done, however, as this presentation will point out.

Aside from technical obstacles, the task of industrial hygienists was rendered more difficult because of the early opposition of industrial management, which viewed with some suspicion any suggestion that concerned the improvement of its workers' environment. It regarded such suggestions, by and large, as altruistic or paternalistic, and it took a lot of arguments backed up by good factual evidence to convince it that a safe and sanitary workroom was good business.

The industrial hygienist's approach was necessarily through management, because any program of action was bound to involve expenditure. Management alone was in a position to make a capital outlay and it was felt that it would make it if the program were economically sound. It is not pertinent to this discussion to detail the history of the campaign and it should suffice here to say that industry, as a whole, is now fully convinced that a safe and sanitary environment is necessary to maintain and promote its workers' health. A measure of this conviction is evidenced by industry's annual expenditure of many millions of dollars to further this objective.

Of course, not all industrial establishments have fallen in line as yet, but in due time they will do so. There are still some die-hards who feel that industrial hygiene endeavors are a lot of poppycock; and we still have the poor with us, the very small shops operating on a shoestring for whose especial benefit something must be worked out. Therefore, industrial hygienists are not, and I do not think ever will be, entitled to rest on their laurels in that respect.

In the course of their activities, industrial hygienists have come to realize

* Chairman's address presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 3, 1944.

that their approach to the solution of the problem, namely through industrial management, has been one-sided and that there is another party, namely organized labor, that should be convinced of the need for competent guidance. It has been found that it is not conducive to fruitful operations to have a receptive industry and an unreceptive labor attitude. Industrial hygienists have made demands of industry which are not only to its advantage but are also greatly to the benefit of the workers, and the least that could be expected of the latter would be intelligent, not to say sincere, coöperation. If it is good business for the employer to have healthy workers in healthful surroundings, it is also definitely good business for the workers to be in good health and work in hygienic shops. The employer may get other workers to replace the disabled, at high cost of course, but it is not always possible for the worker to regain his full health and full earning capacity. Little effort has been made to work on labor at large, and, in particular, to convince it of the necessity of complying with protective regulations and of intelligently using preventive facilities, provided and designed for its benefit. Labor looks askance at all this activity, questions its purpose, and wonders about its scope and implications.

Labor has seen safety programs and measures brought into industry and has acquiesced because the results were visibly obvious to all concerned: it is not possible to gainsay a lost eye or hand. However, this condition did not prevail and has not prevailed, in regard to preventive measures concerning health matters which are neither immediately visible nor spectacular. For instance, there was much ado at first about preëmployment medical examinations. Labor refused to have its members examined on the assumption that these examinations were to be used for ulterior purposes, such as discrimination in employment. Perhaps labor was right, perhaps not, but it took a long time to convince the majority that proper job placement, prevention and cure of revealed diseases, were the objectives as much for its benefit as for industry's. To counter this attitude there was a general concerted effort made to educate labor, as was previously done to convince management, that such was a good business proposition. Even now some are still unconvinced.

A similar situation has now arisen in connection with measures inaugurated to prevent the occurrence of occupational diseases among workers. It is true that these measures may at times somewhat impede the facility with which certain operations are performed; they may interfere with certain good or bad but lifelong habits formed by the workers; or they may seem superfluous to some; but in spite of the most excellent reasons for these measures, labor will, in many instances, fail to coöperate.

The industrial hygiene profession as a whole is sincerely dedicated to one proposition: to promote and maintain a good health standard among industrial workers. It has now a wonderful opportunity to do the same job with labor that it did with industry. As said before, industry originally opposed the efforts of industrial hygiene because it did not understand the objectives, and labor now opposes them for the same reason. The solution of this problem lies in education and for that there must be, first of all, a meeting of viewpoints and policies. The former has been delayed because of the latter and it is hoped that the present frank discussion will be instrumental in bringing about the beginning of a rapprochement between the industrial hygiene profession and labor. The time is late and much irreparable harm may be done by further unnecessary delays.

Members of the industrial hygiene profession are identified either with the official agencies or industrial establishments or universities. Industrial hygienists in industry are unfortunately very much in the minority and necessarily restricted in their scope. Industrial hygienists in universities, foundations, etc., are engaged almost exclusively in research work; they provide most of the fundamental information for practical application and they do not, as a rule, come in contact with either labor or industry. It is the industrial hygienist, identified with a city, county, state, or federal department, in close contact with industry and labor under many conditions, who is of the greatest interest at the moment.

It is my contention that the responsibility for educating labor in the activities and functions of industrial hygiene should devolve on the members of official agencies. They are in a strategically advantageous position to perform this educational job because of their professional knowledge, their impartial position as government representatives, their possession of industry's confidence, and their number. Through membership in their national conference, official industrial hygienists can, moreover, act in unison on administrative matters, irrespective of their geographical location. Because of these advantages, they are best suited to accomplish this task and should draft a general policy of labor education and provide the leadership for carrying it into effect.

Admitting the cogency of the foregoing proposition, I believe that the situation will call for a slight reorientation of the official industrial hygienist's attitude on coöperation with labor. In some instances, his frame of mind may not be in the best of condition in that respect. It may be that this individual has, through the years, neglected to cultivate and maintain a position of absolute impartiality in regard to all parties soliciting his assistance. As stated before, the official industrial hygienist's mission is to promote the health of the industrial worker, and any thought or deed short of absolute impartiality will not enable him to fulfil that mission and to that extent he will have failed. It is this very attitude of impartiality that won over the industrialist and it will be the very same attitude which will gain labor's confidence. The present situation will not be helped in the least by assuming a policy of the proverbial ostrich hiding its head in the sands and saying that there is no such problem and that everything is sweetness. To gain labor's confidence, it will be necessary to offer more than lip service; deeds will prove more effective. This is where leadership will count.

By the same token, however, labor will have to coöperate to the extent of divesting itself of occasional ill-founded suspicion toward the official industrial hygienists, a suspicion that seems to be based on a misconception of their procedures. For instance, labor has sometimes growled when all the data from a plant study it had requested were not submitted to it. In the first place, management now exhibts a far greater interest in its workers' environment than labor, and, in the second place, labor cannot fail to realize that management alone is responsible to government for the health and safety of the workers; this responsibility has been made patent in the health and safety clause of the Walsh-Healy Act. Labor has to be satisfied mainly with a brief statement of conditions found rather than a comprehensive report. The latter is the official industrial hygienist's basis to work and follow through on management to get the necessary improvements. There is no intention to sidetrack or brush off labor. It is merely the best way, at present, of getting accomplishments and, as long

as these are brought about, the means seem justifiable. This situation is somewhat similar to that where a small community engages a consulting engineer to design a bridge. The engineer will study certain existing conditions, design the bridge to meet these conditions, and submit an estimate of its cost. He will not, however, go into the mechanics and procedures involved in the construction of the bridge. These are not of particular interest to the community as all they want to know is that the bridge will be suitable to carry a certain traffic load, its architectural appearance, and cost.

Some labor leaders have taken a great interest in the subject of industrial hygiene and made various attempts to extend that interest to the entire labor movement. An interested outsider would gather the impression, however, that the labor movement was, as a whole, in a somewhat confused state of mind or else had not given this matter the thorough attention it merits. The importance of preventing occupational diseases in industry seems to be realized, and organized labor feels that it should have a definite part in this worth while program, but as yet has not developed a national program to include consultation, on a planned basis, with members of the industrial hygiene profession, either in connection with environmental sanitation or with medical programs.

It is my thought that the necessary leadership to bring about labor's cooperation should originate with the official agencies charged with the responsibility of furthering industrial hygiene. Otherwise, labor will some day accept leadership which may result in objectives unidentical, not to say conflicting, with those now conceived by the official agencies.

In order to start the ball rolling and provoke thought and discussion of this subject with a view to distilling a practical policy, I present a few suggestions, as follows:

That the official industrial hygienists—

1. Attempt closer and more frequent contact with labor in order to develop a better appreciation of its viewpoint.

2. Cultivate and maintain a more coöperative attitude in dealing with labor, on the time tested premise that good understanding begets good understanding.

3. Impress upon labor the absolute need for competent impartial services, and that these can only be rendered by the official agencies.

4. Initiate an educational campaign to acquaint labor with the scope and importance of occupational health hazards to which its members are exposed and thereby obtain better coöperation on remedial measures.

On the other hand, to obtain the desired results at a national level, labor has to—

1. Abandon its suspicious attitude and realize that sincere coöperation is readily and fully available for the mere asking.

2. Provide in its organization a division of competent industrial hygienists, through which it will create its own educational program, and use it as an intermediary to effectuate proper coöperation with the official agencies.

3. Make up its mind that it will do its part sincerely to insure success in its efforts for improving the environmental working conditions of its members.

As a further suggestion to labor at the local level it may be added that—

1. The formation of plant labor-management committees on health and safety may be of great importance, provided that their personnel is not the same as that handling economic grievances. Members of these committees should be made up of men and women selected on the basis of genuine interest in human welfare and may well comprise, if available, the plant physician, safety engineer, and nurse.

2. Such committees should be empowered to handle suggestions and complaints concerning both health and safety, discuss them and decide whether or not corrective measures are needed.

3. In the case of inability to reach agreement, the official fact finding agency should be called in to make a thorough study and present its data and recommendations to the committee.

4. Improvements or alterations of a major nature, deemed necessary by the committee, should be referred to top management for its acquiescence.

It is realized that only some 25 per cent of the workers are organized while the official industrial hygienist's job is to insure a safe and sanitary environment for all the workers. Yet this organized portion of labor makes it a good medium to deal with and any benefits accruing to it will, no doubt, accrue also to the unorganized portion.

These thoughts are presented to start some thinking among industrial hygienists. On further consideration, other suggestions will no doubt present themselves. A good and practical policy of coöperation and collaboration will not be brought about overnight, but by a full and frank interchange of ideas within the ranks of the industrial hygiene profession and with labor representatives.

All parties concerned must be made to realize the importance of their contribution to the problem of controlling the occurrence of occupational diseases:

1. Management has the moral and legal responsibility of furnishing a safe and healthful environment for the workers.

2. Labor has the moral responsibility to convince its members that they should comply with the necessary dispositions to insure their well-being.

3. Official industrial hygienists have the legal responsibility of demanding that a safe and sanitary environment be provided for all industrial workers.

To make this presentation reasonably brief, enough material has been purposely omitted to form the subject matter of many others, a fact which, no doubt, will be fully understood.

The foregoing discussion merely represents the speaker's personal thoughts. It does not assume that industrial hygienists will regard it as the formulation of a policy, but rather as the forerunner of a series of discussions from which a policy will be derived.

Fort Greene Industrial Health

The first annual report of the Fort Greene Industrial Health Committee, "Brooklyn Accepts the Challenge" is the story of what is called "a unique experiment in adult health education." The Fort Greene Health Center district, including a population of more than 200,000 is the most industrial district in Brooklyn with more than 200 plants employing about 150,000 workers. The committee believes that it has proved both the possibility and desirability of management, labor, organized medicine, and public health agencies working together to improve the health of the industrial community.

Basic in the committee's success, about which it is properly proud, is obviously its ability to look unpleasant facts squarely in the face. Included in its report is a graphic chart showing some of the social, economic, and health data for the district, divided into nine sub-districts. Its median monthly rental is lower than that of the city as a whole, its unemployment rate is higher, the infant mortality rate and the death rate from tuberculosis, cancer, pneumonia, heart diseases, and accidents are higher than those for the city. Is there not an old saying that recognizing one's faults is already half the battle of correcting them? The Fort Greene Industrial Health Committee apparently believes so. The report can be secured from the Fort Greene Industrial Health Committee, Fort Greene District Health Center, Brooklyn, N. Y.

The Statistical Approach to the Cancer Problem in Massachusetts*

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STATISTICAL studies inspired the Massachusetts Cancer Program, determined its scope, evaluated its activities, changed its policies, and elicited new ideas in cancer control.

The results of many of these studies have been reported in the literature, some have been utilized in official documents, while the findings of still others have never been published. The data used in these studies fall into five general classifications: the death record, the clinic record, the hospital record, the house-to-house survey, and the selected sample survey. The statistical procedures utilized have for the most part been simple and only the occasional study has demanded the more advanced statistical treatment.

The objective of this paper is a demonstration (through exemplification) of the integration of statistics in the Massachusetts Cancer Program. Most of the material selected is from studies that have not been incorporated into the literature, either because these studies are confirmation of previous ones or because their brevity does not warrant an independent report.

DEATH RECORDS

A type of data readily available and one from which much information can be procured is the death record. A study of the accuracy of the cancer death certificates in Massachusetts in 1932 was made by Macdonald.[1] The results were obtained by comparing the death certificate data with the composite information received by interviews with the family and all physicians who attended the patient, together with a study of the case history from the hospital records. The analysis indicated that the identification of cancer deaths was sufficiently accurate to warrant statistical compilations of data on the disease as a whole.

A comparable study was conducted using a sample of the 1939 cancer deaths. The results indicated that there had been considerable improvement in cancer consciousness. This sample showed that the accuracy of the cancer death record had improved 2 per cent regarding the presence of cancer and nearly 7 per cent regarding primary location of the disease. In Table 1 the percentage agreement of

TABLE 1

Percentage Agreement of Verified Diagnoses with Death Certificates

	Number of Death Certificates		*Percentage Agreement*	
	1932	*1939*	*1932*	*1939*
Buccal cavity	79	74	83.5	85.1
Digestive tract	1,028	972	75.5	84.3
Respiratory tract	64	102	68.8	70.6
Uterus	213	140	80.8	82.9
Breast	225	210	98.7	98.1
Other female genital organs	43	40	76.7	85.0
Male genitourinary organs	169	155	83.4	88.4
Skin	28	25	57.2	76.0
Other and unspecified organs	180	239	66.7	70.7
All locations	2,029	1,957	78.2	83.5

* Presented before the Cancer Symposium, in association with the Seventy-third Annual Meeting of the American Public Health Association, New York, N. Y., October 2, 1944.

verified diagnoses with death certificate diagnoses, subdivided by location of cancer, showed an improvement in 1939 over 1932 which was significant by the chi-square test.

On the basis of these findings the recorded deaths from cancer are sufficiently accurate to warrant their use for statistical procedures, but equal reliance cannot be placed on studies based on the data of individual sites of cancer.

The death records may be used to confirm or disprove tentative hypotheses which have been advanced by other research workers. In 1940 Ciocco,[2] using Washington County, Maryland, data, reported an apparent tendency for both husbands and wives to die of cancer. He compared his observed finding of 29 such couples with an expected number of 19.9 and a control number of 19.0. The chi-square test on his data was 4.98 with a probability of 0.0257. Considerable interest was aroused in the medical profession following the publication of this paper and it was felt that if the findings represented general truths the public might postulate contagion.

In order to confirm or refute this study a comparable one was done using Massachusetts figures. Two types of data were used: one comprising material comparable to Ciocco's in the number of married couples but covering twice as long a period of time; the other comparable to his in length of time but having one-half as many married couples. Duplicating the method which Ciocco used in obtaining his expected values, the number of husbands and wives dying of cancer in both Massachusetts series showed no association between marital status and cancer.

It was thought that, due to the change in the cancer death rate over an extended period of time, a better expected value could be computed. This was accomplished by applying to each surviving spouse of the husband or wife who died of cancer the probability of his or her death being due to cancer at the age and the time at which each died. The summation of these comprised the expected number of deaths from cancer among spouses. The expected values for both Massachusetts sets of data were used to compute chi-square tests. The results showed no significance. Ciocco obtained the number of control non-marital couples who had cancer and found a difference between these and the marital couples. In Massachusetts no significant difference was found. Ciocco states in his report: "In the case of widows and widowers who died of cancer, 13.3 per cent of their spouses had died from this cause and only 9.4 per cent of the spouses of all the widowed. The difference is probably significant from a statistical standpoint since it is over twice its standard error." Similar compilations from Massachusetts data did not show significant differences.

Inasmuch as the Massachusetts figures did not substantiate those of Maryland, it is believed that the Maryland figures represented the unusual occurrence and that the cancer incidence in husbands and wives is not related. Further investigation may be desirable.

The death certificate furnishes the best data for measuring the efficiency of the cancer control program. The decrease in the cancer death rate after adjustments have been made for changes in the population structure, and after allowances have been made for chance variations, furnishes a clear-cut picture of the cancer situation. Due to the life span of cancer patients, the effect of control measures is not reflected in the death rate immediately, but a lag must occur between improvement in the cancer situation and evidence of this from the death certificate. The death rate, adjusted for age and sex, has been

TABLE 2

Comparison of Maryland and Massachusetts Data in Respect to Deaths from Cancer Among Husbands and Wives

	Maryland *	Massachusetts	
	1898–1938	1841–1932	1893–1932
Both husband and wife died of cancer	29	18	12
Expected number of husbands and wives to die of cancer. Method A †	19.9	19.0	15.4
Expected number of husbands and wives to die of cancer. Method B ‡	.....	17.8	13.5
Number of control non-marital couples both of whom died of cancer	19	18	11
Chi-square test based on expected values computed by Method A †	4.98	1.23	2.42
Among widowed persons who died of cancer, percentage of spouses who also died of cancer	13.2	7.8±1.8	8.3±2.3
Among all widowed persons, percentage of spouses who died of cancer	9.4±0.6	8.4±0.5	10.9±0.9
Total married couples	2,571	2,600	1,210
Number of deaths from cancer among husbands	187	194	115
Number of deaths from cancer among wives	274	255	162
Number of deaths from cancer among widowed persons	219	231	145
Number of deaths from cancer among spouses of widowed persons	242	218	132

* This part of table constructed from data in "On the Mortality of Husbands and Wives." *Human Biol.*, Dec., 1940.

† Method A for computing expected values. Apply the product of the probability of husbands dying of cancer and that of wives dying of cancer to the total married couples.

‡ Method B for computing expected values. Apply time-age-sex rate to surviving spouses of husbands or wives with cancer.

periodically examined to determine changes in the trends.[3] During the early years of the Massachusetts program the female cancer rate adjusted for age was almost trendless. From 1932 to 1943 inclusive, it dropped from 127.0 to 117.5 per 100,000 population. The male rate adjusted for age continued as an upward trend until 1941 and since then has fallen slightly, possibly indicating the beginning of a downward trend. While the drop in the cancer death rate is not great it has been consistent. It is a tangible evidence of accomplishment and warrants an optimistic point of view.

CANCER CLINIC RECORDS

The records of the Massachusetts cancer clinics are an important source of data. The original record listed ten items of information to be obtained from the clinic patients. At the suggestion of Professor E. B. Wilson, Chairman of the Statistical Advisory Committee for the Cancer Program, the record was limited to a minimum number of items to avoid disturbing the patients unduly. This principle has been continued, with only a slight increase in the original number. These items included identifying data, reason for coming to the clinic, duration of symptoms before first visit to a doctor and before first visit to a clinic. These were arranged in the form of a code so that underlining alone would be necessary in filling out the record. Other items to facilitate short studies have been incorporated into the card, used for a few years, and then discarded. On the original card four items dealing with diagnosis and recommendations for treatment were filled out by either the physician or the follow-up worker. In the present revision this has increased to eight items. Progress notes are incorporated with the original record until the report is closed. All cancer cases, with the exception of approximately 2 per cent lost, are followed until death. The clinic cards have been used for four general types of study: the evaluation of the program, etiological studies, material for educational purposes, and for the measurement of routine activities.

The various periods of delay between first suspicious symptom and treatment have been recorded on the clinic cards.[4]

In the first year of the Massachusetts Cancer Program the delay between the first symptom and consulting the first physician was 6.5 months. For the next 8 years this period of delay remained practically constant (trend coefficient $= -.06 \pm .05$). Since 1935 there has been a statistically significant downward trend with a new low of 3.3 months reached in 1943 (trend coefficient $= -.32 \pm .03$). Perhaps a more informative appraisal is the percentage of individuals visiting their physicians within 1 month of noticing suspicious symptoms. In the 4 year period 1930–1933, 12.7 per cent of individuals with cancer who attended the clinics consulted their physicians within 1 month of recognition of suspicious symptoms. In a corresponding period 10 years later the rate had increased to 22.4 per cent. The greatest improvement was noted in the cases of skin cancer. Improvement in rapidity of seeking diagnosis is an excellent method of evaluating a cancer program.

Since an earlier study from data collected by the Visiting Nurse Associations had suggested a possible relationship between tobacco and cancer, the chairman of one of the clinic committees requested that this be substantiated by data collected from clinic patients.[5] Information on the use of tobacco was obtained from 2,927 male clinic patients over the age of 40. They were divided into those who used no tobacco, those who reported slight use, moderate use, and excessive use. Attack rates were computed for cancer of the buccal cavity, digestive tract, respiratory tract, skin, and for cancer of all other sites. There was a definite association between cancer of the buccal cavity and the use of tobacco. There also appeared to be some association between the use of tobacco and cancer of the respiratory tract. These findings confirm the opinion held by many clinicians.

An important part of the Massachusetts Cancer Program consists of furnishing information to the public regarding prevention and the importance of early recognition and treatment. One of the difficulties encountered is the skepticism on the part of many regarding the curability of the disease. When actual figures demonstrating cures can be produced, a large part of the skepticism disappears. The clinic cards have furnished such information.[4] Individuals with skin cancer treated within the first month showed 80 per cent living at the end of 10 years while those who delayed more than 1 month had a survival rate of only about half this figure (43.9 per cent). Similarly, cancer of sites other than skin showed a 10 year survival rate of about 38 per cent among those treated within 1 month contrasted with 20 per cent among those who were not.

The data from the clinic cards have been used as a guide to administrative procedure, such as the measurement of

TABLE 3

Tobacco and Cancer—3 Year Period

Rate per 100, by Site

Extent of Use of Tobacco	*Males Over Age of 40 in Massachusetts Cancer Clinics*	*Cancer of the Buccal Cavity*	*Cancer of the Digestive Tract*	*Cancer of the Respiratory Tract*	*Cancer of the Skin*	*Cancer of All Other Sites*
None	655	3.7	5.6	0.5	11.3	5.5
Slight	357	8.1	9.5	1.1	7.8	7.8
Moderate	1,155	11.5	8.3	2.0	12.5	5.2
Excessive	760	17.9	5.8	1.7	13.0	4.6

the effectiveness of the follow-up service in the clinics.[4] Perhaps one of the most informative figures of this type is that which showed that in 1943 81.1 per cent of recommendations made by clinic physicians had been put into execution within 1 month. Another interesting compilation is the survival rate of cancer patients which has been computed from these cards for the past 17 years.

HOSPITAL DATA

Reporting of cancer is not attempted in Massachusetts but the periodic collection of hospital data furnishes a somewhat similar type of information. Hospital morbidity is not total morbidity, but recent studies indicate it is approaching that optimum. In 1932 approximately 70 per cent of cancer cases were hospitalized. This has increased to about 85 per cent at the present time.[4]

HOUSE-TO-HOUSE SURVEYS

Data collected by means of house-to-house surveys have been voluminous. The book *Cancer and Other Chronic Diseases in Massachusetts*[6] was based on such surveys. The most recent use of this method has been several public opinion polls to determine the knowledge of the people regarding cancer, and their sources of obtaining this knowledge.[7] Partial correlations have been computed to determine the real value of the various educational media. About one-quarter of the individuals surveyed displayed some knowledge of cancer by answering correctly three pertinent questions relative to the disease. The principal source of their information was reading material.

SELECTED SAMPLE SURVEY

Another form of survey is that utilizing the selective sample rather than the random one. An example is the true-false test conducted in the Lynn High Schools as a measurement of the value of the experimental program of cancer education.[8] Four groups of students received different types of instruction in the hope of ultimately determining the best approach to this problem. The methods employed were the general assembly, detailed instruction in the biology class and in the public health class, and bulletin board exhibits. A fifth group of students did not receive instruction. As a measurement of this experiment, true-false tests were given. In order to minimize the possibility of a student obtaining a high mark by guesswork, twelve thoughts were presented in this questionnaire, each expressed four times in a different manner, and a score was given only when all four parts of the same thought were answered correctly.

The results of this test indicated a definite upward trend in cancer knowledge as the students progressed from the lower to the higher grades, and suggested that the most satisfactory approach is detailed instruction in the biology class. The experiment is to be repeated and should substantiate or disprove this opinion.

SUMMARY

This paper is a report of some of the statistical work that is being done as a part of the Massachusetts Cancer Program. The results from several studies furnish examples of the application of various types of data.

SOURCE OF DATA AND RESULTS

Death Records

The death records can be freely used in studies of cancer as a whole but are not sufficiently accurate to warrant too much credence in cancer of individual locations.

Massachusetts figures do not indicate any association between cancer and marital status.

One measurement of the efficacy of the Massachusetts Cancer Program has been the drop in the adjusted death rate.

Clinic Records

The decrease in delay between first symptoms recognized by the patient and first visit to a physician is tangible evidence that the public has become more cancer conscious.

The use of tobacco is strongly associated with cancer of the mouth and to a lesser degree with cancer of the respiratory tract.

The clinic follow-up service of cancer patients has shown that among those who sought treatment within the first month, twice as many were cured as among those who did not seek treatment within that period.

The fact that over 80 per cent of the recommendations for clinic patients have been carried out within 1 month is a criterion of the excellence of the follow-up service.

Hospital Data

There has been a steady increase in hospitalization of cancer patients in Massachusetts.

House-to-House Surveys

The knowledge of the public regarding cancer and the sources of obtaining this knowledge has been ascertained by house-to-house surveys. About one-quarter of the individuals surveyed displayed some knowledge of cancer by answering correctly three pertinent questions relative to the disease. The principal source of their information was reading material.

Selected Sample Surveys

The true-false test incorporating a multiple presentation of similar thoughts to limit good scores by guesswork has demonstrated improvement in cancer knowledge of high school students following an experimental course of instruction on the disease.

CONCLUSION

A complete list of the problems in cancer which have been studied statistically in Massachusetts would be far outside the limits of this report. These few examples have been chosen to show different types of studies and some of the different approaches. The findings in some of the studies influenced the program as a whole, while those of others only a part. The decrease in the death rate and the duration of delay before seeking diagnosis were measures of the whole program and aided administrative evaluation, while the value of the cancer poll was limited to the educational groups.

The statistical approach is fundamental in attacking the cancer problem from the public health standpoint. A program based on this approach provides a graphic picture of the extent of the problem and of past accomplishments, and it suggests new measures of control. Appraisals of activities elicit information as to the relative merits of each endeavor, and are a necessary adjunct to any control program.

Comprehensive data aid not only in the solution of the immediate, local problem, but they may be of use to those who are delving into the many ramifications of the larger problem.

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Study and Control of Industrial Atmospheric Pollution Nuisances*

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THE field of nuisance control is extremely broad and this paper will be confined to a discussion of nuisances resulting from atmospheric pollution of industrial origin. Nuisances of this type are caused by atmospheric contaminants of three types: inert smokes and dusts, mucous membrane irritants, and malodorous substances.

Smokes probably constitute the most widespread of the atmospheric contaminants. Studies made in this country and elsewhere indicate that the atmosphere of every city is polluted with minute solid particles resulting from the combustion of fuel, and in the various forms of soot, fly-ash, and unburned or partially burned solid fuel. A study [1] of fourteen American cities made in 1936 by the U. S. Public Health Service showed that this type of particle approximated ½ micron in size and was present to the extent of about ½ mg. per cu. m. of city air. The results of this type of atmospheric pollution are evident in terms of long-time blackening of buildings and damage to drapery and dry goods rather than in discomfort on the part of the persons breathing the polluted air. This fact and the widespread occurrence of smoke pollution have produced a considerable degree of tolerance by urban populations. It is uncommon therefore to receive specific complaints of smoke pollution unless an unusually severe amount of smoke is being released.

Release of dusts from industrial plants much more commonly results in trouble. Such dusts range in particle size from about 1 μ to as high as 100 μ and cause definite subjective symptoms of discomfort when breathed. Rock crushers, cement plants, smelters, roofing plants, sand blasting plants, and a variety of industrial processes which involve the release of organic dust are common offenders. Usually such dusts are a nuisance, pure and simple, but sometimes there is added the fear of damage due to the toxic character of the dust. Examples of this are the silicosis hazard from sandblasting or the lead poisoning risk from backyard plants where storage battery plates are reclaimed.

Mucous membrane irritants form a widespread and important group of atmospheric contaminants. High on the list is sulfur dioxide which is released in quantities of many tons per day from single oil refineries and smelters. Other acid gases such as chlorine and phosgene are frequently released from industrial plants, usually

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as a result of an accident or some disturbance in plant process. These gases are chiefly respiratory irritants. Other gaseous products, usually organic vapors, are tear gases irritating to the eye. In this class are the aldehydes. Especially to be mentioned is acrolein, which is associated with the manufacture of soap, the cooking of varnish, and with many processes involving the thermal breakdown of oils. During the war the building of synthetic rubber plants with the consequent release of such vapors as those of butadiene have greatly aggravated the eye irritation problems in some areas. Sometimes in the manufacture of certain chemicals there will be the inadvertent formation and release of vesicant gases such as mustard.

Particularly troublesome among the mucous membrane irritants are the acid mists. Most prevalent of these is sulfur trioxide released in the production of sulfuric acid. Before the war most of the sulfuric acid plants were able to control their loss of sulfur trioxide reasonably well, but after Pearl Harbor the demand for high octane gasoline produced by the alkylation process using 100 per cent sulfuric acid as a catalyst soon changed the picture. One hundred per cent sulfuric acid is made by mixing 98 per cent acid with oleum, and many plants formerly making 98 per cent acid went into the production of oleum without a suitable type of equipment for control, and in addition began to overload their plants. The result has been the release of sulfur trioxide in amounts causing respiratory irritation not only to an uncomfortable degree but in some cases to an extent actually dangerous to life.

Less prevalent but very serious when they do occur are pollutings of the atmosphere with anhydrous hydrogen chloride. These most frequently are caused by accidents in plants producing the gas.

The occurrence of atmospheric pollution with mucous membrane irritants not only causes discomfort to the persons exposed but frequently arouses in them an instinctive dread that is intensified by statements they have read relative to the use of poison gases in warfare. Consequently when they make their complaints they are extremely insistent and many times unreasonable in their demands.

The trials and tribulations of a nuisance investigation officer are frequently severe when he is working on smokes, dusts, and irritant gases, but these are as naught compared to his troubles when he tackles the job of studying odor nuisances. Here he finds himself confronted with a thing that no two people can describe accurately, that cannot at the present time be measured by any objective means, and for which the only subjective measuring instrument, namely the human nose, not only varies widely in sensitivity among different persons but becomes so quickly fatigued as to be utterly unreliable. Trouble makers in the industrial odor field include oil refineries, soap factories, rendering plants, tanneries, sewage treatment plants, and a host of others.

Successful handling of atmospheric nuisance complaints requires two basic lines of action, and failure in one of them is apt to nullify any amount of good work in the other. The first line has to do with public relations and the second with the technical study of the problem. Many persons have become disgusted with the field of nuisance abatement because the complaining parties charged them with being partial to the industrial plant causing the nuisance or because the plant itself refused to take the problem seriously. Situations of this sort can only be avoided when the investigator realizes that a suitable groundwork must be laid before a successful study can be started.

The first step in laying this groundwork consists of a careful canvass of the area from which the complaints have been received to determine the nature, extent, seriousness and frequency of the air pollution. In making this canvass it is essential to interview a representative group of people in such manner as to get the true facts of the situation.

At the time when complainants are first interviewed it is important to explain to them clearly the powers and limits of the investigating agency and to outline the nature of the study to be made. Failure to do this may either unduly raise their hopes that a complete abatement will be made at once or lead them to feel that they are not getting the service to which they are entitled. In either case their confidence in the integrity and ability of the investigating agency will suffer.

Studying a nuisance is in many respects like studying an outbreak of communicable disease, and the six cardinal principles of field investigation laid down in 1936 by Lumsden [3] are worth repeating here:

1. First and foremost and above all else, *work*, and that means hard work and plenty of work.

2. Patient, painstaking, careful and thorough collection of all available facts which may have any bearing on the situation, and due consideration of every possible factor until the inoperative ones can be eliminated beyond reasonable doubt.

3. Broad-mindedness and open-mindedness in obtaining and in studying data, and, in conducting interviews to obtain data; avoidance of any tendency to lead witnesses.

4. Maintenance of a reasonably clear perspective, and refrainment from superficial surmises, from hasty half-baked conclusions and from fixed opinions or efforts to prove something which may not be so, or to marshall facts so that they may tend to support unduly a "hunch" or a preconceived hypothesis or theory before all the salient returns are in.

5. Assemblage of the data so that they will make a clear-cut, readable picture with first things first and with the foremost facts sufficiently but not unduly emphasized.

6. Common sense and honesty in the interpretation of the findings so that the facts will compel a reasonable conclusion and not be twisted, distorted, or obfuscated so as to be made to appear to support a conclusion perhaps desired but false.

Having determined by a canvass of the affected area that the nuisance complained of is real and sufficiently serious to warrant a thorough-going study, the investigator is ready to begin the actual technical study of the problem itself. The study will of course vary with the type of problem but will usually include the following seven features:

1. Discovering the identity of the causative agent.
2. Location of all points of dispersal.
3. Selection of suitable sampling methods.
4. Planning and carrying out the sampling program.
5. Study of the physical factors affecting dilution.
6. Interpretation of results.
7. Securing of the needed corrective measures.

Those who have had experience in the abatement of atmospheric pollution nuisances will appreciate that it is much simpler to *list* the steps to be taken than it is to carry them out. The first step listed was to identify the causative agent. Sensory reactions give the first clue. It usually is possible to tell by eye whether the atmospheric contaminant is in the form of dust, mist, or gas, and the sense of smell is highly useful as a means of recognizing odorous substances. Irritations of the respiratory system or eyes serve to point out the presence of the irritant gases and mists and give a clue as to their identity. Other clues may frequently be found from a careful observation of the environment. Hydrogen sulfide will always leave its mark in the form of blackening of lead base paints and sulfur dioxide will show itself in the form of damage to certain types of vegetation. One of the best aids is a

thorough knowledge of the aerial waste products discharged from the industrial plants in the vicinity and an acquaintance with the history of the area in question. Industrial nuisances have an annoying habit of recurring over and over again from the same plant.

The second step in the study is location of the release points of the material causing the trouble. Sometimes this can be done by eye when a visible stream of smoke, mist, dust, or other material can be seen to travel directly from some stack or opening to the area of complaint. Usually, however, the investigator is not so fortunate. Then he must proceed in a careful manner indeed since if he prematurely points the finger of accusation at the wrong plant as the source of the trouble or fails to recognize all the sources when there are more than one his whole study is bound to end in failure. A careful observation of wind direction at the time of occurrence of trouble usually serves to locate the source to the nearest 45° of direction, that is, to locate it in the right quadrant with respect to the area of complaint. All the industrial plants in this quadrant within a reasonable distance should be visited and the problem should be presented to them in a straightforward manner. A list should be made of all likely release points. Qualitative tests then should be made of material discharged from these points to see whether it is the same as that encountered in the area of complaint.

When the cause of trouble is an unusual substance not ordinarily found in the atmosphere this method is conclusive. When the substance is a common one, such as smoke or fly-ash, something further in the way of proof is needed. Several means have been used in this respect successfully, two of which will be mentioned. Both of them make use of some index or marking property either normally present or added to the released material which can be recognized in great dilution. It has been found possible to add to a smoke stream in a stack certain salts which have been made radioactive and which retain radioactivity for about two days. Since radioactivity can be detected in extremely minute quantities recovery of this radioactive smoke or dust has served as a means of proving the point of origin of the nuisance in about the same way as the adding of fluorescein to a cesspool and subsequent detection of it in a well serves as a means of proving the source of sewage pollution of the well. Sinatt [4] in England has reported on the formation and occurrence of cenospheres, which are hollow spheres formed when various solid fuels are burned at temperatures above 600° C. in an insufficiency of air. These spheres, which range usually from ¼ to ¾ mm. in size, do not have smooth unbroken surfaces, but rather, the outer surface is composed of a latticework the pattern of which varies with different parent substances. If these cenospheres are found in the deposit of solid air-borne material at the site of the complaint there is excellent chance of finding with certainty their source. Other index methods of this type will suggest themselves.

We come now to what is perhaps the most critical part of the whole study, the selection of suitable sampling methods. At this point the investigator is frequently sailing on uncharted waters. At the release points the concentration of the atmospheric contaminant may be extremely high, but in the areas of complaint the concentrations usually are so low that ordinary chemical methods are not nearly sensitive enough to measure them. Most chemical methods permit measurement of gases and vapors down to about 1 p.p.m. by volume. Consider then the problem of studying the occurrence of ethyl mercaptan which can be detected by the human nose at

a concentration of a fraction of one part per billion. Another aspect of the problem is adverse sampling environments. In the field, sampling may have to be done in the wee small hours of early morning out in the middle of some field, or the sampling may have to be done in motion to follow the vagaries of path of some gas or smoke stream. In some cases a continuous twenty-four hour record must be secured and the sampling maintained for several weeks at a time. The problem is seen then to be no mean one. Let us consider first the sampling of dusts and smokes. In this field we have several reliable instruments to choose from. Electrostatic precipitators have the advantage of high collecting efficiency for particles ranging widely in size, concentration, and composition, and collected samples may be examined for total weight and specific ingredients, and with certain modifications of the equipment, also for particle size. Various types of impinging apparatus permit estimation of number of particles per cu. ft. Filter paper types of sampling equipment are available to collect samples which can be quantitated on the basis of depth of stain. The weaknesses of this type of sample are obvious, but automatic recording instruments are commercially available and this feature is very valuable. The study [1] made by the U. S. Public Health Service of the "Atmospheric Pollution of American Cities" illustrates the application of these types of equipment.

In the sampling of mucous membrane irritants we are usually dealing with materials commonly encountered and measured in industrial workroom atmospheres, and the measurement of these substances at the sources where concentrations are high usually presents no serious problems. In the areas of complaint, however, the matter requires something special in the way of sampling equipment from the standpoint of great sensitivity and self-recording nature. When the irritant is sulfur dioxide or sulfur trioxide the Thomas autometer,[5] which has been developed and widely used by the American Smelting and Refining Company, exactly fills these requirements. This instrument, which is sensitive to concentrations of sulfur dioxide and trioxide as low as two parts per billion, collects its own samples on a prearranged schedule, oxidizes the sulfur dioxide to trioxide and measures the resulting sulfuric acid by the change in conductivity of the absorbing solution. Recently this instrument has been adapted not only to measure and record the two gases above mentioned, but also to measure separately and record the total concentration of many other gases which may be present. Among these are hydrogen sulfide, carbon disulfide, ethyl mercaptan, and thiophene.

At the present time there is no satisfactory objective method of measuring odors as such. Two by no means conclusive but still highly suggestive pieces of research on this problem have been reported. In 1919, Zwaardemaker [8] of Utrecht demonstrated that when water containing an odorous substance is sprayed under pressure through a fine orifice, an electrostatic charge positive in sign is created on the jet, but that this is not the case for nonodorous substances. He developed equipment for measuring this charge and stated that the same magnitude of charge represented threshold of odor regardless of the nature of the odorous substance. The writer has experimented with similar equipment, and while he has observed the phenomenon reported, he has not been able to confirm all of these claims. The subject deserves more study, however, since a reliable method of measuring odors is needed at the present time. In 1938, Dyson [10] in England reported on the possibilities of the use of the Raman shift as a quali-

tative means of measuring odors. Raman had observed that, when a monochromatic source of radiation is caused to pass through certain substances, the transmitted radiation has a frequency different from that of the source. Dyson's experiments convinced him that all odorous compounds will give such a shift and that nonodorous compounds giving a shift are nonodorous by reason of lack of vapor pressure or lack of solubility in lipoid matter so that they do not reach the olfactory nerves. He tested the amplitude of the Raman shift of many odorous compounds and found that compounds having similar amplitudes had similar odors even though their chemical compositions were not even remotely alike. While neither of these two methods may prove sound or practical, they are at least thought provoking and may lead the way to the discovery of a truely scientific method of measuring odors that will match our present methods in the fields of light and sound.

Until such a method has been developed the human nose remains the most satisfactory odor-measuring instrument in spite of its many shortcomings. Subjective observations can, however, be reinforced by certain general chemical tests among which are the following:

1. Measurement of the chlorine demand of the odorous substance. This method is based on the observation that most organic odorous vapors are oxidizable and will readily combine with chlorine to form nonodorous end products.

2. Oxidizing in a heated quartz tube in the presence of platinum as a catalyst and measuring the resulting strong acid. This method, which is used in the improved Thomas autometer, is based on the fact that organic sulfur compounds comprise a large fraction of the trouble producers.

The fourth step of the study mentioned was planning and carrying out of the sampling program. This step will of course be governed by the nature of the problem, but sampling points will usually be chosen both at the points of release of the air polluting substance and at strategic points in the affected area. The sampling program at a plant must be such as to cycle all pertinent operations. Such sampling should be done in the presence of and if possible with the help of plant personnel. In many cases, if the right sort of relations have been established, this entire assignment can be safely left in the hands of the plant with only occasional checking by the official agency. Occasionally, but not often, the needed information has already been secured by the plant. Sampling in the field must be done at the times of occurrence of nuisance and since these times are impossible to predict accurately the investigator has two choices. The first is to give the key complainants his phone number and go to bed at night with the assurance that he will always be called at the time when he least wants to be. The other is to use automatic recording equipment. The advantages of the latter method aside from the piece of mind of the investigator are obvious. The most important requirements of a field sampling program, aside from the soundness of the methods used, are that it be thorough and not require that conclusions be based on one or two samples. It should be recognized that a proper study of a nuisance takes time and no study should be entered into unless a thorough job can be anticipated.

In spite of the most painstaking and patient efforts to collect convincing samples in the field this type of evidence is often unsatisfactory or at best incomplete and must be reinforced by an estimation of the probable concentrations of polluting substance that will reach a given area from a given release point under most critical conditions. This estimate is based upon the concentrations of polluting substance released

and the amount of dilution that takes place. An appraisal of the physical factors of the area will permit an estimate of the magnitude of such dilution to be made.

Most local nuisances occur when the affected area is directly in the wake of a point from which a polluting substance is being released and the stream of polluted air is traveling directly to the affected area. If the affected area is at the same height as the release point, all that is needed, of course, is a wind in the right direction, but if the release point is high above the ground, as is frequently the case with tall stacks, then *downwash* of the discharged air must take place before a nuisance will occur. Sherlock and Stalker [12] have reported on the factors responsible for downwash from stacks and, on the basis of their criteria, it is usually possible to forecast the likelihood of this phenomenon in a given setup. The forecasting of probable dilution factor is a more complicated problem but certain aids are available. The first step is to ascertain the type of flow at the release point, that is, whether it is streamline or turbulent. Streamline flow is to be avoided since polluted air discharged in this manner may travel for considerable distances practically undiluted. Streamline flow seldom occurs at stacks but may occur when polluted air is escaping from the top of a reaction tank or through a door or window.

If the air is discharged in a turbulent stream or jet, such jet rapidly increases in volume with consequent dilution of polluting material as a result of air entrained. This characteristic of jets is well understood and has been formulated by several investigators. Experiments and studies reported by the U. S. Bureau of Mines [11] indicate that an upward discharged turbulent jet from the top of a stack may be bent over to a horizontal axis by wind without destroying its jet properties, and that factors of dilution at given instances of travel can be computed with rough accuracy for given horizontal distances if the stack velocity and wind velocity are known. From this it will be seen that with a sufficient amount of information as to the type and velocity of flow of the polluted air stream, height of release point and surrounding buildings, direction and velocity of prevailing winds, and topography of area, it is possible to forecast to some extent the probability of the polluted air stream reaching a given area and the degree of dilution that would have taken place under the most critical conditions (that is, to forecast the maximum concentration that could be encountered at the area).

Where a large number of sources are simultaneously in action the single jet type of estimate cannot be used since there is more likelihood of general pollution of all the atmosphere in an area. In such cases the occurrence of low ceilings with resultant holding down of polluted air is of more concern. Such low ceilings may result from low lying fogs or from temperature inversions, and in forecasting such occurrences a record of meteorological data is essential.

When all of the results are in, both from the sampling program and from the study of physical factors just discussed, an interpretation must be made which will result in the reaching of certain definite conclusions. These conclusions must cover the following points:

1. Can the nuisance be definitely attributed to polluted air discharged from certain known points?
2. In case of an affirmative answer to the above question, what type and degree of change in discharge of polluted air will alleviate the situation?
3. What changes in plant process are needed to bring this about?

Having arrived at an answer to the three questions listed above, the last

and most important step of all remains, that is, to get the needed corrections made. There are three possible means of accomplishing this. The first and most natural of the three is to persuade the plant to make the changes voluntarily. This can very frequently be accomplished since most industrial plants value the good will of the people living near them. Failure to secure such voluntary corrections most often results from a failure of the investigator to present the problem in such manner as to command the respect of the plant personnel.

The second alternative is of course court action. While unpleasant, sometimes this type of action cannot be avoided, and health departments should not hesitate to employ it when the issue is clear and other attempts have failed. If a health hazard is involved the action will probably be initiated by the health department. If no health hazard is involved but the nuisance is merely an offense to the senses, action will probably be brought under the state penal code by the district attorney or other similar prosecuting agency. If the case does come to court the investigator will have an excellent opportunity to find out how good a job he has done in studying the problem.

The third alternative does not give immediate relief, but it is the writer's opinion that it is the one that in the long run will prove the real solution to the industrial nuisance problem. This is long-time planning. Such planning includes not only carefully worked out industrial zoning, so that industries commonly causing nuisance will not be located in the heart of residential districts, but also the establishment of standards of performance with respect to the release into the atmosphere of polluting substances. This will require legislation of an enlightened type. It will also require more technical knowledge than we now possess, but enough knowledge is already available for a start and a start must soon be made. The reconversion of wartime industry to peacetime processes gives us an unprecedented opportunity to take great strides in this field. It remains to be seen if we have the vision and courage to seize this opportunity and make the most of it.

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Proposed Report on the Educational Qualifications of Executives of Voluntary Health Associations*

I. Definition

Voluntary health associations are nonofficial groups interested in the public health situation as a whole or in one or more specific health problems.

The term "executive secretary" refers to the chief executive officer of a voluntary health association.

II. General Scope of the Field

In 1945 voluntary health associations in the United States totaled in excess of 20,500. Of these, 1,271 were visiting nurse associations, 9,542 were Red Cross chapters and branches, 1,694 were crippled children's societies, 1,450 were field army units of the Cancer Society, and 2,609 were infantile paralysis committees. Most of the remaining 4,000 associations were of specialized character, 3,031 being in the field of tuberculosis. Of this number 650 tuberculosis societies were said to employ executive secretaries, with perhaps 400 of them devoting full time to their health educational, promotional, fund-raising and other duties, with 250 devoting part time to these tasks. About 65 groups engaged solely in work related to social hygiene, and of these about 20 employed full-time executive secretaries. More than 100 groups combined interest in tuberculosis and social hygiene. There were about 50 state or regional cancer groups beside the field army units mentioned above, of which about 35 employed full- or part-time executive secretaries. In addition there were 67 mental hygiene committees or societies, 28 for the prevention of blindness, at least 56 for child health, 158 for the conservation of hearing, 27 for heart disease, 147 for planned parenthood, 6 diabetes associations, 49 health councils, and 316 councils of social agencies. The last two groups represent agencies interested in community health programs, in health education, in appraisals of health work, and in social research as applied to health. Their chief functions are coördination and promotion, not as service or operating agencies. Some are known as health councils, some as health federations, some as health divisions of city or county councils of social agencies.†

A notable trend in voluntary health associations has been to broaden their programs rather than to concentrate on only one specialized health problem. For example, some of the tuberculosis associations include such activities as the promotion and improvement of school health services, general health

*. The Committee on Professional Education of the American Public Health Association publishes this report before transmittal to the Governing Council in order to permit the members and Fellows of the Association to review it and to offer criticisms and suggestions in the further consideration of the report. This report, like all other statements of the committee on professional and technical qualifications in public health, is subject to periodic revision in order that it may be kept abreast of the best thought.

† See *A.J.P.H.*, 34, 7:757–759 (July), 1944.

education, and community education in nutrition. Tuberculosis associations in a number of states have added programs in the control of the venereal diseases, heart disease, diphtheria prevention, dental hygiene, and mental hygiene.

The Committee for the Study of Voluntary Health Agencies, of the National Health Council, is completing the report of a nation-wide survey which will give additional information on the organization and activities of voluntary health associations and which should be consulted for further information.

There will unquestionably continue to be a need and place for voluntary health associations and a trend in the direction of generalized health organization as distinguished from specialized organization. It seems likely that considerations of efficiency, economy and harmony will favor a trend locally and perhaps also on a state-wide basis toward a single generalized unofficial health association instead of a multiplicity of specialized, separate, independent, unrelated and more or less competitive voluntary associations of varying degrees of stability, responsibility and permanency.

III. The Functions of Voluntary Health Associations and the Duties of Their Executives

A. *Functions of Voluntary Health Associations*

Among the *functions* of these associations are the following:

1. To survey the health situation of a particular area to determine health needs and to aid the constituted public health authorities in dealing with problems requiring constructive action.
2. To promote sound community programs and strive to eliminate duplication and friction.
3. To interpret the work of the health authorities to the public, thereby increasing recognition and support.
4. To encourage, stimulate, and assist public health authorities to improve their standards and objectives.
5. To carry on a continuous program of health education for the general public, to the end that the people may know the available facilities for diagnosis, care, and treatment, and how to make appropriate use of them.
6. To arouse and mobilize public sentiment for the establishment and support of necessary public agencies and facilities.
7. To create an informed public opinion that will demand efficient results from governmental administration and rally to its support if unjustly attacked.
8. To take appropriate action with regard to health legislation.
9. To undertake for a temporary trial period newer activities in public health work until their practicability is demonstrated and public sentiment justifies their assumption by appropriate public authorities.
10. To undertake studies of educational and administrative methods.

These functions should be exercised in coöperation with the professions of medicine, dentistry, nursing, and other professional groups.

B. *Duties of Executive Secretaries*

Beside the duties implied in the functions of a voluntary health association, the executive secretary, jointly with the official authorities, should study the health situation in the area in order to appraise what is being done by the constituted health authorities and other agencies, and to help his agency formulate its program to meet the apparent needs. He is then expected—

1. To direct the program of activities adopted by his organization.
2. To keep the members of his governing board fully aware of their responsibility for the effective functioning of the organization.
3. To stimulate, advise, and assist the board in the raising of funds for financing the activities of the organization.
4. To engage a staff of qualified assistants within the limitations of available funds, plan and direct the work of the staff, organize and supervise the business administration of the organization.
5. To recruit, train and utilize wisely the services of volunteer unpaid workers.

6. To establish and maintain coöperative relationships with the tax supported health authorities and with the other voluntary associations concerned with public health problems.
7. To organize and conduct, in consultation with the official agencies a program of public information and education in that particular public health problem with which his organization is concerned, utilizing available channels for publicity such as newspapers, magazines, motion pictures, radio exhibits, lectures, bulletins, meetings, institutes, and conferences.

In the case of health councils, public health federations, or health sections of councils of social agencies, the executive secretaries usually devote more time to studies and appraisals of the needs of the community and to the promotion of effective coördinated action on the part of the various authorities in meeting these needs through constructive group action, than they devote to activities in specialized fields of public health. Such groups do not usually render direct service to individuals.

IV. Broad Educational Background (Undergraduate)

A collegiate or a university education with a baccalaureate degree should underlie the preparation of all persons for these positions. Among college graduates preference on the whole should be given to those who have majored in such social sciences as sociology or political economy, or in such natural sciences as biology or bacteriology. Systematic training in English composition and public speaking is desirable, for the ability to write well and to speak effectively is essential.

V. Graduate Education

Knowledges and skills needed to carry out the aforementioned duties are:

A. *Knowledges*

1. A working knowledge of the scientific aspects of the communicable diseases, especially tuberculosis and the venereal diseases: their nature, epidemiology, prevalence, mortality, transmission, control, and prevention.
2. Knowledge of leading problems in public health, such as infant and maternal mortality, dental health, mental hygiene, pneumonia, cardiac diseases, medical supervision of school children, prevention of accidents, the major industrial diseases, nutrition, and the environmental factors that affect the public health.
3. Information about the community health program, especially the organization and work of the official health agencies, and their accepted functions; information about the facilities and institutions engaged in the control of tuberculosis and the venereal diseases, in programs for infant and maternal health, in the medical supervision and health instruction of school children, the facilities and methods for dealing with environmental sanitation, and the provisions for medical care.
4. A knowledge of the fundamentals of public health legislation and of the mechanics of legislative process as commonly practised in the passage of laws and in the budgeting of appropriations.
5. A knowledge of the principles of public health education and of the media and channels available therefor (see A.P.H.A. report on the Educational Qualifications of Health Educators *).
6. A knowledge of methods for systematic record keeping and other office procedures.

B. *Abilities and Skills*

1. Ability to organize and conduct a continuous campaign of public education, utilizing all available channels for communicating information to the public.
2. Ability to arouse and mobilize public opinion in behalf of some particular objective, such as the employment of a full-time trained health officer, or the organization and extension of clinics or the establishment of public health nursing services.
3. Skill in public speaking and ability to adapt the manner of presentation and the choice of language to the intelligence and social outlook of varied types of audiences.
4. Skill in the techniques of organizing and conducting meetings of his own organization, its board and subcommittees, and of public meetings.
5. Ability to write reports and to prepare programs of work and budgets.
6. Skill in the techniques of surveys and appraisals.
7. Skill in the techniques of fund raising.

* *A.J.P.H.*, 33, 8:998 (Aug.), 1943. Reprints available.

C. *Experience*

Learning how the work of a voluntary health association is organized and carried on by means of a period of apprenticeship or internship on the staff of such an organization under competent supervision is considered a requisite qualification for this position. Such in-service experience in some instances may be acquired while the trainee is in residence at a school of public health or a school of social work.

The degree of Doctor of Medicine is not an essential qualification for candidates in this field but may be advantageous in certain types of organizations. It is, however, vital that the executive secretary be educated in sanitary science and other courses which include the information specified above.

VI. Personal Qualities

An individual fit to carry the responsibilities of an executive secretary should be of good moral character. He should have an attractive personality and good health. He should be alert, open-minded, willing to learn, a clear thinker, and have mature, sound judgment, seasoned by actual experience. He should have qualities of leadership, should possess initiative, should be able to assume responsibility, and to command the respect of his confreres. He should be able to make plans ahead in detail and be skillful in accomplishing results with little friction. As an administrator he should be able to delegate responsibility, to master details, and to budget both time and money.

VII. Approximate Time Required for Preparation

Preparation for such responsibility should include graduate education and a course leading to the degree of Master of Public Health or its equivalent, plus a period of actual experience in the field. This will require a minimum of 12 months' preparation after the baccalaureate degree.

For persons who have not completed such preparation, it is recommended that appointment be made contingent upon the subsequent completion of this training within a specified period.

Following such a course, experience in a voluntary health agency under supervision should precede the assumption of full executive responsibility.

VIII. Type of Institution Best Fitted to Give This Training

Among the facilities regarded as necessary for the adequate training of professional workers for this position is competent instruction, including laboratory exercises, under a variety of teachers who are recognized leaders in their respective fields. There should be a central group of teachers who devote full time to instruction in public health. There is great advantage in obtaining this special training in a university that has immediate access to and coöperative assistance from the faculties of schools of the medical and biological sciences, engineering, education, social and political sciences, economics and business administration. It is essential that the university undertaking to train such professional public health personnel at the graduate level have a suitable library for reference work and ample laboratory facilities. It is essential that such an institution have access to well organized health departments and voluntary health associations which provide facilities for supervised field training and experience. There is considerable advantage in having all necessary facilities for training all types of professional public health personnel in the same institution so that they may all participate in certain basic courses.*

* See Memorandum Regarding Minimum Educational Facilities for Postgraduate Education of Those Seeking Careers in Public Health. *A.J.P.H.*, 32: 5:533 (May), 1942.

The training available in good schools of social work may provide some but not all of the background necessary for an executive secretary of a voluntary health association, who must also take certain courses in public health.

It seems likely that persons employed in these positions in the future will be responsible for voluntary health interests in more than one special field and consequently they should be given a broad basic training of the kind outlined above. To such basic training a specialized focus may readily be added.

It is the intent of this report to cover the field of all executives in voluntary health agencies except visiting nursing associations. Persons particularly interested in the field of tuberculosis prevention should note the report on duties and qualifications of tuberculosis executive secretaries adopted in 1937 by the National Tuberculosis Association on the recommendation of the National Conference of Tuberculosis Secretaries.

The professional competence and accomplishments of many persons now serving as executive secretaries of voluntary health agencies who have not had formal postgraduate academic training are recognized. Persons who have achieved real and notable success during many years' full-time experience in a well organized voluntary health agency should be considered as eligible for positions of higher grade in the same or another similar agency.

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Industrial Hygiene and the Expanded Federal-State Vocational Rehabilitation Program*

DEAN A. CLARK, Senior Surgeon (R), U.S.P.H.S.

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IF industrial hygiene is the first step in the great task of reducing the harmful effects of illness and injury upon our economy and our working population, rehabilitation may well be regarded as the last. Since we are unfortunately not yet in a position to prevent all industrial accidents and diseases, and since diseases and injuries incurred outside of industry are also of great importance among employable persons, adequate rehabilitation services are highly essential if every individual is to contribute to our economy to the greatest extent of which he is capable. Every year, in spite of our best efforts at prevention, some 350,000 persons are disabled by injuries at work, at home, or on the highway, which are sufficiently serious to affect their employability. Besides, there is an untreated backlog of approximately 4,000,000 men and women so severely handicapped as to require physical restoration or vocational training or both if they are to be satisfactorily employable. The handicapped are not only forced to lead fruitless, unsatisfying lives without rehabilitation, they are a drain upon our resources and a loss to our productive man power.

For twenty-three years, ever since the passage of the Federal Vocational Rehabilitation Act of 1920, we have had in this country a program for the rehabilitation of physically handicapped persons, conducted by the Rehabilitation Divisions of the various State Boards of Vocational Education, with assistance from the federal government in the form of grants-in-aid in funds. Under this program, up to 1943, 210,000 disabled individuals have been restored to useful, remunerative employment and to self-respecting, self-supporting lives. This is clearly far short of the need as indicated by the total number of handicapped persons, but it was an important achievement under quite difficult circumstances. The law had a number of limitations which made a complete program impossible. There was a statutory limitation of $3,500,000 on the federal grant; no physical restoration services were included; mentally and emotionally handicapped persons were not eligible for service nor were there special services for the blind; federal funds could not be used to provide maintenance during rehabilitation. In short, the services were limited, for the most part, to vocational counseling, vo-

* Presented before the Industrial Hygiene Section of the American Public Health Association at the Seventy-third Annual Meeting in New York, N. Y., October 3, 1944.

cational training, prosthetic appliances, and placement services for the physically handicapped.

Last year, however, under the pressure of war man power needs, Congress decided permanently to broaden and strengthen the nation's vocational rehabilitation program, and enacted the Barden-LaFollette amendments (Public Law 113, 78th Congress) to the Vocational Rehabilitation Act. These amendments authorize the use of federal funds as grants-in-aid to State Boards of Vocational Education and State Agencies for the Blind for "any services necessary to render a disabled individual fit to engage in a remunerative occupation," including, in addition to the continuance of the services already provided under the original Act, complete medical examinations of every client as a part of the determination of eligibility, necessary medical and surgical services, transportation, maintenance during rehabilitation, hospitalization up to 90 days, occupational tools and equipment. Thus it is now possible for the states to utilize federal funds to aid them in carrying out a complete rehabilitation program for all disabled persons. The federal government reimburses the state 100 per cent for administrative costs and 50 per cent for service costs. These services are primarily for the civilian handicapped, rather than for veterans with service-connected disabilities, who are served by the Veterans Administration under a different Act (Public Law 16, 78th Congress).

With regard to physical restoration, which naturally will be of the most interest to this audience, there are no limitations as to the scope of services which may be provided. They may include not only physicians' and hospital services and prosthetic appliances, but also dental care, convalescent home care, nursing in the hospital or at home, physical therapy, occupational therapy, work therapy, speech therapy, drugs, supplies, etc.

There are, however, some limitations or definitions as to the types of cases which may be brought into the picture: In the first place, the individual, of course, must have a disability which is a substantial employment handicap.

Second, for physical restoration services, the disability must be a static one. Clearly, the intent of Congress in using the word "static" here was to differentiate this rehabilitation program of physical restoration from ordinary medical care for acute illness or injury. In general, we take the word "static" to mean any disability that is relatively stable or slowly progressive. Thus a case of chronic glaucoma, for example, would not have to wait until blindness had occurred before treatment could be provided.

The third limitation with regard to physical restoration is that the disability, in addition to being an employment handicap and static, must be such that by appropriate treatment, it may be expected to be substantially reduced or eliminated within a reasonable period of time. The phrase "within a reasonable period of time" obviously was intended by Congress to distinguish this program from the long-term care of chronic conditions that cannot be much improved. The emphasis is thus upon reconstruction for employment—filling a gap in our publicly supported medical care program that has long needed filling.

Finally, there is a fourth limitation on medical services of a somewhat different character: that physical restoration services may be provided at public expense only in so far as the individual is unable to pay for these services in whole or in part from his own resources. The basic medical examination, however, and the fundamental services of vocational guidance and counseling, vocational training, and placement may be

furnished without cost to the client, regardless of his financial resources.

This pattern follows the traditional pattern in this country. Vocational training, which corresponds to public education, is available to all without regard to financial resources, whereas public medical service, as is generally true, is made available only on a needs basis.

Briefly, the program is being administered in the following manner: There are 51 State Boards of Vocational Education, including those of the District of Columbia, Hawaii, and Puerto Rico, and 31 State Agencies for the Blind, so the national office is dealing with 82 separate state agencies in this program. Where there is no state agency for the blind, services for that group also are provided by the State Board of Vocational Education.

The Office of Vocational Rehabilitation has obtained physicians through the assignment of four medical officers of the U. S. Public Health Service. A national Professional Advisory Committee has been appointed, composed of representatives of such fields of medicine as orthopedics, tuberculosis, psychiatry, otology, industrial medicine, etc., and of hospital administration, public health nursing, medical social work, physical therapy, and occupational therapy. Among its industrial medical members are Dr. Carl M. Peterson, Secretary of the American Medical Association Council on Industrial Health; Dr. Harold Vonachen, Medical Director of the Caterpillar Tractor Company; and Lt. Colonel Raymond Hussey, Director of the Army's Industrial Hygiene Laboratory, and formerly chief consultant in industrial diseases for the Maryland Industrial Accident Commission.

A few fundamental administrative requirements regarding physical restoration have been set forth by the federal office with the concurrence of its Professional Advisory Committee. In the first place, the states are required by the federal standards to have in each state agency a supervisor of physical restoration. This person will presumably be a worker with experience in the medical field, but not usually a physician.

In the second place, each state agency is required to have a physician as medical (administrative) consultant, full- or part-time.

Third, there is required a medical social work consultant, full- or part-time.

Fourth, a state professional advisory committee, similar in pattern of composition to the national committee, is to be appointed by each state agency.

In furnishing physical restoration to the disabled, it is obviously essential that the highest standards of professional care be utilized. The state rehabilitation agencies are therefore being encouraged to select the best qualified physicians, surgeons, and technicians, and the leading public and voluntary hospitals, primarily those approved by the American College of Surgeons. It is probable that most of the treatment services under these programs will be specialty services, and it is expected that these will generally be rendered by physicians qualified for certification by the various American Medical Specialty Boards.

Rates of remuneration for medical and other professional services are to be established by the state agency in consultation with its professional advisory committee. These schedules are not to exceed those in use by the state's crippled children's, or workmen's compensation programs, or those used by the Veterans Administration or the U. S. Employees' Compensation Commission. The purchase of hospital care is to be based on the inclusive per diem rate method, preferably identical with the reimbursable cost formula devised

by the Children's Bureau and utilized by state agencies administering the Crippled Children's and Maternal and Child Health (including EMIC) programs. We are recommending not a similar method of cost accounting, but an identical one, so that a hospital participating in programs of both agencies would prepare figures for the same report form, submitting a properly certified copy to the state health department for the EMIC and another to the State Board of Vocational Education for the rehabilitation program.

Broadly considered, the expanded vocational rehabilitation program is an addition to the public health and industrial hygiene services of the country, as well as to the educational and employment services. From the start, as evidenced by the assignment of medical officers of the U. S. Public Health Service to the Office of Vocational Rehabilitation, the closest coördination with existing public health work has been contemplated. This point of view has been further exemplified in early attempts to draw close together the state health departments and the state rehabilitation agencies. On April 22, 1944, the Surgeon General of the Public Health Service wrote all state health officers apprising them of the new federal functions in rehabilitation, and asking them to offer assistance to the state programs. At about the same time, Michael J. Shortley, Director of the national Office of Vocational Rehabilitation, wrote to all state rehabilitation directors, suggesting that state health officers be invited to assist in their work. The response has been gratifying. In nearly all states, now, the health officers sit on the advisory committees of the rehabilitation agencies. In many, a physician from the health department staff has been assigned, on a part-time basis, to act as medical (administrative) consultant for the State Division of Rehabilitation or for the State Agency for the Blind. Medical social workers have also been loaned by the health agencies to the rehabilitation programs. In many instances, clinics for crippled children, already established under the health department, are being utilized by rehabilitation agencies. The same advisory committees are being consulted, the same fee schedules are being adopted, and the same all-inclusive per diem method of paying for hospital care is being employed by both agencies. All of this, we hope, will serve to make the best use of the facilities and services of both agencies for their mutual benefit and will prevent duplication and competition.

Industrial hygiene and vocational rehabilitation have much to gain from each other as this expanded program develops to full usefulness. The Industrial Hygiene Division of the U. S. Public Health Service has brought the possibilities of coöperation to the attention of all industrial hygiene groups in its *News Letter*, and the Office of Vocational Rehabilitation has asked all state rehabilitation agencies to confer with state industrial hygiene officials. We in the field of rehabilitation need and want the aid of industrial hygiene in many ways. Perhaps the most important is in the matter of placement of handicapped individuals in industry. Even more than for the ordinary worker is it important for the handicapped to work under conditions conducive to good health. Bad working conditions can make a one-eyed worker blind, can cause a cardiac to go into decompensation, can result in a relapse in an individual with arrested tuberculosis.

Rehabilitation services will fail unless they end with placement of the handicapped not only where they can function most efficiently but also where increase of their disabilities will be prevented. Rehabilitation is thus directly

concerned with the best in preventive medicine. We hope that state rehabilitation directors will constantly seek the assistance of industrial hygiene divisions in determining the health standards needed in various occupations to make them safe for handicapped persons—or even to make them useful in reducing the worker's disability. Such collaboration will be valuable, too, for industrial hygiene, because it will serve to bring out new problems needing solution, and will illustrate dramatically by the needs of the handicapped the importance of maintaining high standards in industrial hygiene for the benefit of all workers and for efficiency in production.

We also seek your coöperation in referring disabled individuals to the state agencies. Persons cannot be rehabilitated unless they know about the services available. Remember that any individual who has a disability that constitutes an employment handicap and who can be rendered employable or more advantageously employable may be accepted. Many of you see such persons in your work; give them the opportunity to benefit from our services.

Finally, we shall be looking to you for leadership in research affecting our work. Little is known scientifically about the measurement of the physical capacity of an individual to do a job, especially the capacity of a handicapped individual. New methods must be found to guide us in deciding what work a man can do safely or with benefit, and what he should avoid because of his disability.

There is much we can learn from you, and there are some services we can offer you. We shall do all we can to foster coöperation between us, and we are looking forward to working with you for the common benefit of our industries and of our millions of potentially useful disabled workers.

Best Sellers in the Book Service for April

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The Control of Communicable Diseases. American Public Health Association. 6th ed., 1945..... .35

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FRANKLIN DELANO ROOSEVELT

WHEN they learned of the death of President Roosevelt, millions of men and women throughout the world felt the bereavement and the dazed uncertainty of children who have lost a father. In London and Paris, in Moscow and Chungking, he has been the outstanding symbol of the democracy for which we have suffered and fought.

As the days pass, this sense of deprivation merges in a deeper appreciation of the glory of a life lived at the peak of devotion to mankind and closing almost at the climax of victory for the common causes of our race. He has carried his work so far and done it so well that we should be craven if we doubted our moral strength to follow through on the broad lines he has laid down.

The great ones of the earth have testified to the wider implications of Franklin Roosevelt's life. We can record here only our gratitude for the leadership he has given in our little corner of the field of human culture. As Governor and as President, he supported with notable results the upbuilding of the New York State Department of Health and the United States Public Health Service. In Washington, he gave us our first national Social Security Program and our first national Housing Program—two essential factors in the structure of public health.

He was a great American who piloted our country through two of the most perilous crises of its history—the Great Depression and the Second World War; and he marked out the course we can follow to attain security from similar catastrophes in the future. He was a great humanist in the sense defined by Archibald MacLeish when he said, "It is necessary to believe in man, not only as the Christians believe in man, out of pity, or as the democrats believe in man out of loyalty, but also as the Greeks believed in man, out of pride."

Humanism in this connotation was perhaps the keynote of President Roosevelt's personality. He understood human needs and he had faith in human power. To justify that faith by carrying forward the age-long struggle for a better world is our obligation and our opportunity.

THE NURSE IN INDUSTRY

THE year 1945 marks the fiftieth anniversary of the first utilization of the services of the nurse as a factor in promoting the health and efficiency of industrial employees.[1] Since Fletcher D. Proctor, president of the Vermont Marble Company engaged Ada Mayo Stewart for this purpose in 1895, much water has passed over the dam. The March issue of *Public Health Nursing* presents some reminiscences of this pioneer effort by Miss Stewart (now Mrs. Henry J. Markolf); and Bethel McGrath contributes an admirable review of the evolution of this branch of nursing service during the half-century which has elapsed.[2]

The National Survey of Registered Nurses conducted in 1944 reported 11,220 industrial nurses in the United States, and Dr. J. W. Mountin has estimated that this number should be nearly doubled (raised to 20,000) in the post-war period. We hope and believe that American industry in its reconstruction phase will be conscious of the vital importance of the human factor in the production problem and will plan broadly and constructively for the promotion of health, efficiency, and morale. The industrial nurse should occupy an important rôle in this task—a rôle which will be particularly vital in view of the war veterans to be reëmployed in industry, who will need special consideration from the standpoint of adjustment, both physical and emotional.

The problems of industrial nursing are peculiarly difficult, on account of the professional isolation in which the factory nurse so often works. It was for this reason that a Committee To Study the Duties of Nurses in Industry was established by the Public Health Nursing Section of the A.P.H.A. in 1940, on the suggestion of Ruth Houlton, and under the chairmanship of Olive M. Whitlock. The report of this committee, published in 1943 [4] is a document of the very first importance. It outlines in detail the specific duties which the industrial nurse should be called upon to perform—and others which she should *not* be called upon to perform; it suggests sound machinery for organization and channeling of responsibility; it emphasizes the opportunities of the industrial nurse in the plant health education program and in the promotion of certain specific worker welfare activities; and it recommends that industrial nursing service be extended to include home visitation. The Publications Lists of the A.P.H.A. and the N.O.P.H.N. contain many other valuable reference sources in this field. Among recent contributions are the discussion by Anna M. Fillmore of nursing records in industry,[5] and by H. G. Dyktor of relations between industrial hygiene and labor in the present issue of this JOURNAL.[6]

The Committee on Duties of Nurses in Industry recommends that one industrial nurse should be provided for up to 300 employees; 2 or more nurses for up to 600 employees; 3 or more nurses, up to 1,000 employees; 1 nurse for each additional 1,000, up to 5,000 employees; and one for each additional 2,000 employees above that point. The problem of the small plant—as in other fields of industrial health—is the weakest link in our chain. Some 26 million workers in the United States are to be found in plants employing less than 500 workers each; and 13 million are in plants employing less than 100 workers. The only practical way to meet their needs is through part-time service provided by a voluntary or official public health nursing group. Beginnings made in this field have done little more than scratch the surface. In New York City, where the Visiting Nurse

Service has offered such service, less than 0.5 per cent of employees in shops employing less than 500 workers have been reached. In Long Island City, an experimental demonstration works on a program of 3 hours of nursing service per week per 100 employees—a far cry from the standard of one full-time industrial nurse per 300 employees cited above. Even such tentative approaches are, however, of value. Anna M. Fillmore has presented an admirable review of part-time nursing to the small plant,[7] in which she emphasizes that such service should be planned under the guidance of a representative community group (including labor, as representing the consumer, and the professions and official agencies providing other industrial health services); that it must be integrated with a parallel community plan for providing part-time medical service for small plants[8]; and that the nurse serving in this field should have specific training in the industrial field, continuous in-service education, and adequate supervision.

This problem presents a definite challenge to the public health and nursing professions. It is by no means easy of solution and will require the best thinking of all groups directly concerned; and also of our educational institutions. *Public Health Nursing* reminds us[9] that "Since the basic preparation of nurses can be only broad and general, industrial nurses are seeking added preparation through postgraduate work from universities." It is gratifying to know that "Universities are preparing to meet this need by providing special courses and some will offer a year's program of study in industrial nursing as the demand arises."

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HOUSING INSPECTION — 1945 MODEL

THE Committee on the Hygiene of Housing of the A.P.H.A. was established in 1936 (on the request of the Housing Commission of the League of Nations) to develop a scientific health approach to the important problems of housing. It has served as a valuable link between public health groups on the one hand and housing and planning bodies on the other. During the spring and summer of the present year, it will publish in detail a method of attack on one particular phase of the general problem which is of direct significance to every health administrator —the quantitative appraisal of substandard housing.[1]

The local health officer, in almost every community, is, or should be, officially responsible for the correction or condemnation of housing conditions which constitute a public nuisance or are directly detrimental to health. He has generally worked in this field in a haphazard fashion, often only on stimulation by individual

complaint, and without generally accepted standards to guide an inspection staff, whose members as a rule are not possessed of special technical skill. It can fairly be said that this field of health administration has seldom been a source of pride and satisfaction.

To meet this situation, the Committee on the Hygiene of Housing has prepared —after four years of preliminary study and exhaustive retesting—an inspection method which makes it possible for the average health department inspector (or for even less trained personnel) after a very brief period of instruction, to appraise the quality of the individual dwelling unit on an objective and quantitative basis. The quality of the physical environment of the structure—often as important as that of the home itself—can also be evaluated under this plan, by the health staff in coöperation with other local departments. The standard appraisal covers 30 specific items in regard to the structure, and 24 items in regard to its environment, carefully selected on the basis of their hygienic importance and practical measurability. For each of these items there has been worked out a series of penalty scores, related to the health significance of each item. Adequate homes in a satisfactory environment will approximate a total penalty score of zero; extreme slum areas have incurred median scores of the order of 125 penalty points for environment and 150 points for dwelling conditions. Furthermore, the system also identifies certain Basic Deficiencies, which represent defects of such a serious nature as to warrant direct and immediate official action. Both penalty scores and Basic Deficiency scores have, in repeated tests, been found to give a clear and reliable measurement of actual housing conditions, which can be used as a basis for remedial action.

While the method is based on standard schedules, it has a high degree of adaptability. The scoring of deficiencies can be modified to suit local conditions. Heating facilities, for example, are of major importance in a northern city but not in the deep South. Special items of local importance can be added to the schedules, and a study may be made either on a sampling basis or by inspection of every dwelling.

This appraisal procedure has been employed for official use in Portland, Me., New Haven and several smaller cities of Connecticut, and is at present being applied on a large scale in Los Angeles. Studies of limited areas have been made in Washington, D. C., Philadelphia, Pa., and Red Wing, Minn.

The cost of applying this procedure has proved reasonable. The dwelling appraisal can be accomplished at a rate of 3 man-months of time per thousand dwelling units for the field survey; with approximately the same amount of clerical work for office processing and analysis. The environmental survey will take from ¼ to 2 man-days per block, for field and office work combined, depending on the detail of results desired.

The use of this appraisal method has been found of the greatest value in city planning and the location of housing and redevelopment projects. It yields information urgently needed by housing and planning bodies and provides a basis for coöperation with such groups, which is essential to the success of health efforts in this field. After a survey has been completed, the quality of each block, or other significant area, can be charted so that it is possible to determine quantitatively the degree and kind of inadequacy which exists. It may thus be determined whether a given area is suitable for rehabilitation or whether it is so far gone that it must be entirely replaced by new housing or diverted to other than resi-

dential use. In Memphis, the Health Department has used a similar procedure to determine where its legal powers can be most effectively used.

We look forward to the time when the health department will employ this technique, or some of its major elements, for continuous and routine survey of all potential problem areas, instead of limiting its work in housing to response to random complaints. We should not have made much progress with restaurant inspection if we limited our efforts to conditions called to our attention by irate customers. We shall achieve full results with regard to housing only when the program is developed as a truly comprehensive one.

For this purpose, we have now a relatively simple and economical instrument, which can raise housing inspection to the level of scientific and effective administrative practice.

REFERENCE

1. The technique of this appraisal procedure is described in three reports published for the committee by the Milbank Memorial Fund under the title "An Appraisal Method for Measuring the Quality of Housing." Part I, describing the general technique and illustrating how its results can be applied to local housing problems, is already available; Parts II and III, which give details of survey and scoring procedure for the dwelling and its environment, respectively, will be issued during the summer. All reports may be obtained from the Book Service of the Association.

SCHOOL HEALTH INSTRUCTION IN NEW YORK STATE

HEALTH instruction in the public schools of the United States was first introduced into the curriculum in the latter part of the 19th century under most unfortunate auspices. The laws of the time (some of which are still on the statute books) required the teaching of hygiene primarily as an adjunct to the temperance movement; and definite allotments of time were specified to be devoted to the horrors of alcohol. Lurid descriptions of the condition of the drunkard's stomach were, indeed, the bright spots in a dreary routine of anatomical detail, which constituted a major outrage on the unfortunate child population of the day.

Early in the present century, Dr. L. Emmett Holt of New York, with the very competent aid of Sally Lucas Jean, initiated a far-reaching reform in health instruction, concentrating on habit formation, rather than the names of the bones of the skull and including dramatic teaching devices for vitalizing the whole subject. In no field of educational technique have greater advances been made during the past quarter-century.

Procedures are still, however, spotty and uneven. A study made in 1938 in New York State schools,[1] " revealed a wide range of achievement within the apparently uniform framework of the state-wide system." In one community, the survey reported that " From kindergarten through junior high school, there is a definite and planned sequence of instruction which ' takes into consideration the living problems of the children ' and is ' functional rather than theoretical.' " " Health instruction is, throughout, correlated with daily living and markedly individualized. There is planned coöperation between home and school so that parents are ' taken along ' with the plan of health instruction." At the other extreme were school systems where instruction was purely formal, based only on the use of a textbook and " almost as lifeless and pedagogically ineffective as the ' temperance physiology ' of twenty years ago "; and other systems with " a program conceived in the spirit of modern education but so planless and so lacking in content as to be quite as valueless as the dead routine of unrelated content."

It is gratifying to note that the Division of Health and Physical Education, of the State Education Department at Albany, under Director Hiram A. Jones, has recently taken important steps to raise the general level of teaching in this important field. In 1942, the Commissioner of Education adopted a new set of Regulations on Health and Physical Education [2] which contained the following major provisions: The elementary school curriculum shall include health teaching for all pupils, including in kindergarten and primary grades a program for "guiding the children in developing desirable health behavior, attitudes and knowledge through their everyday experiences in a healthful environment"; and in grades 4, 5, and 6, planned units of teaching "which shall include health instruction through which pupils may become increasingly self-reliant in solving their own health problems and those of the group." In junior high school grades (7, 8, 9), in addition to continued health guidance, "provision shall also be made for approved health teaching, either as part of a broad science program or as a separate course." In the senior high school grades (10, 11, 12) "provision shall also be made for an approved course or courses in health teaching carrying one unit of credit." The requirement of unit credit represents an advance of major importance in making health teaching a vital reality.

A final paragraph on the general scope of health instruction deserves quotation:

"The staff of each school shall coöperatively plan a unified, sequential program including instruction in the following:

"a. Adjustment of the physical, mental, and social aspects of the school's environment to the needs of pupils.

"b. Provision for the study of children's health needs and special attention to the health of individual pupils through personal advisement and remedial instruction.

"c. School lunches, adequate diets, and food habits.

"d. Coöperation with parents in studying individuals and planning for health; and

"e. Coöperation in community health activities."

The formulation of such a general program is a first step along the road. The next essential is provision of basic teaching material; and the University of the State of New York (of which Health and Physical Education is a division) issued last fall an admirable Health Teaching Syllabus for Junior and Senior High Schools for this purpose.[3] The Syllabus was prepared with the advice of leading experts in public health and education and is a notable contribution in its field.

A third essential—if programs and syllabi, however excellent, are to become effective—is the personality and competence of the teacher. The New York regulations require that health instruction in the high school grades shall be given by "teachers with approved preparation," and that "a member of each faculty with approved preparation shall be designated as health coördinator." Here is the rub! The number of certificated health teachers is as yet highly inadequate. It is gratifying to know that steps have already been taken by the authorities at Albany to stimulate in-service training through summer sessions at teachers' colleges, through extension courses and through local workshops under qualified leadership. Much remains to be done; but New York State has made an excellent start.

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Credit Lines

INDIANA LOOKS AHEAD

"The Health Platform for the Coming Years" and an editorial "What of the Future of Health in Indiana" appear in the October issue of the Indiana State Board of Health *Monthly Bulletin*. Here Thurman B. Rice, M.D., Professor of Bacteriology and Public Health at the Indiana University School of Medicine and Acting State Health Commissioner during the absence in the service of the United States Navy of State Health Commissioner John W. Ferree, M.D., presents some of the material that appears in the Commonwealth Fund publication *Local Health Units for the Nation*. This is the title of the report of the A.P.H.A. Subcommittee on Local Health Units, and will be reviewed in the *Journal*.

Since its appointment in July, 1942, the committee has been preparing a proposed plan for local public health service to serve every individual in every county of the United States. This report will show for each state existing personnel and budgets as well as proposed basic minimum personnel and budgets for each of the 48 states and the District of Columbia. Using the material of the committee, Dr. Rice points out that, although Indiana is among the richer states, its per capita expenditures for local health service are fifth from the bottom and less than those of three states much less favored economically, Mississippi, Arkansas, and Alabama.

Dr. Rice, in his articles suggests that the one dollar per capita (the amount suggested by the committee as adequate for a basic minimum local health service) would provide $3,500,000. He estimates that this sum is one one-thousandth of Indiana's share of one year's cost of the war. He says further graphically that "it would build about 100 miles of concrete pavement or would put Indiana among the leaders with regard to our most valuable asset—health."

Among the proposals made in "The Health Platform" are: a reorganization of the State Board of Health, a codification of the public health laws, the organization of the state into health districts of such size that each district may have an efficient full-time health department, and the development of a strong Department of Public Health at the Indiana University School of Medicine.

This is one of the concrete evidences that the Committee on Local Health Units has had of the need which its work has met. It is glad to have made its contribution to the Health Platform of Indiana as approved by the Indiana State Board of Public Health and published in its monthly bulletin.

VITAL STATISTICS DIRECTORY

The Vital Statistics Section announces the publication of the third edition of the *Vital Statistics Personnel Directory*. The Directory was compiled under the sponsorship of the Membership Committee of the Vital Statistics Section, whose Chairman is Dr. Arthur W. Hedrich. The new *Directory* contains twice as many names as the first edition issued ten years ago. This increase is a dramatic illustration of the expansion in this field of public health activity, as well as a tribute to the efforts of the committee to secure complete coverage of persons engaged in the collection, publication, analysis or supervision of vital statistics.

Dr. Hedrich gives deserved credit to

the working committee composed of representatives from nearly every state who brought in the various listings. The directory was made possible only because of this coöperative effort. He further points out that the committee also endeavored to include all statistical personnel of public health agencies known to be serving with the armed forces.

The *Directory* will be distributed without charge to each member and Fellow of the Vital Statistics Section. The cost to others will be 75¢. Copies may be purchased through the Association's Book Service.

STATESMEN DISCOVER MEDICAL CARE

Under the above title, Michael M. Davis, Ph.D., Chairman of the Committee on Research in Medical Economics, summarizes a significant medical care event as follows in the April *Survey Graphic:*

> On the eighteenth of January the estate of the late Edsel Ford—four acres sweeping down to the Detroit River two and a half miles from the center of the city—was overrun by auto workers. They were not trespassers. They owned it. Their union had bought it for a health center.
>
> In the mansion where the grandchildren of Henry Ford once played, x-ray apparatus, laboratory benches, examining tables, and medical record files stood ready for work. At the dedication of this Health Institute the chief speaker was the Surgeon General of the United States Public Health Service. The family of Henry Ford has not "moved from shirtsleeves to shirtsleeves in three generations," but in much less than that time its employees have taken long steps from hired help towards self-determination. The Health Institute is part of that self-expression, based upon the understanding that the people's health may be achieved by the people themselves by organized as well as individual action.
>
> This diagnostic clinic has been recognized as a community service. The Detroit War Chest has given $40,000 for its educational and psychiatric work which will reach beyond the automobile workers themselves. The federal government has recognized its significance through the Public Health Service, three members of whose staff are on the Institute's medical council.
>
> Dr. Thomas Parran took the occasion of the dedication to offer the most comprehensive national health program which the U. S. Public Health Service has yet presented. He stated objectives, not a scheme of legislation or administration. In scope and aims his program goes beyond the Wagner-Murray-Dingell bill of 1943 and may correspond more closely to what rumor suggests the 1945 bill will contain.
>
> At the time of the National Health Conference in 1938, the program of the U. S. Public Health Service covered hardly half this ground. During the same period, the American Public Health Association has made similar progress.

Then Dr. Davis summarizes the evidence of official interest in medical care: "adequate medical care . . . and the right to achieve and enjoy good health" as one of President Roosevelt's "basic freedoms," the declarations of both Wendell Willkie and Thomas E. Dewey during the 1944 campaign, Henry Wallace's inclusion of medical care in his "Economic Bill of Rights," and finally the Interim Report of the Senate Subcommittee on Wartime Health Education.

And what of conservative medicine in the meantime. Dr. Davis agrees that it has moved "up to twenty years behind the times." It no longer opposes health insurance *per se* but only compulsory health insurance; in other words, it accepts limited sickness insurance because no other course is open in view of public opinion.

SOME ACTIVITIES OF THE SECTIONS

Health Education Section Regional Program

Taking note of the nation-wide "Regionalism" movement, the Health Education Section of the Association is organizing the work of the current year on a regional basis. It has added to its committee structure six regional committees whose purpose "is to encourage the discovery of regional and local pub-

lic health needs; to locate and publicize effective regional practices now in operation; to find regional resources; to develop materials and practices applicable to the solution of local and regional problems." All Fellows and members of the Association working in the six regions are members of the regional committees. Other committees of the Section, such as those on Compensation and on Health Films, have representation from each of the regional committees.

Carrying the regional idea further, the Section is now planning that the program for the next annual meeting shall grow out of the committee work and be devoted to a study of the regional plan as developed by sociologists and public health workers.

What is "regionalism" and why is it developing? As federal functions have broadened, centralization and uniformity have increasingly developed in the past decade. In order to preserve the virtues of variety and individuality within a common framework, federal agencies such as the Farm Security Administration, the U. S. Public Health Service, and many others have organized their work in regions. Thus the regional officers can take account of the region's habits and traditions in a way that is not possible in a program wholly directed from Washington, or indeed from any single vantage point. Thus while technical procedures, minimum standards, and administrative practices grow out of centralization, the actual local performances are geared to meet the regional needs; regional staffs are residents of the region and are a part of its civic life.

This development stems back largely to the rural sociologists, as exemplified by Howard Odum of the University of North Carolina, who wants to preserve the separate flavors and customs of the various parts of the United States in spite of the great mobility of the population and the various influences tending toward uniformity and regimentation. In other words, they want to preserve the virtues of being "different from the Joneses" rather than of "keeping up" with them.

PUBLIC HEALTH DENTISTRY

The book on Public Health Dentistry authorized by the Section on Dental Health and approved by the Editorial Board is taking shape. At the February meeting of the Editorial Board a suggested table of contents with possible authors was considered and approved. The book is designed as a source book rather than a textbook and will include, among others, chapters on dental economics, on trends in public health dentistry, on local, state, and federal programs, on the place of the dental hygienist, and on prepayment plans for dental care. The volume is planned to be ready for publication early in 1946.

THE SOCIAL HYGIENE CAMPAIGN IN THE OTHER AMERICAN REPUBLICS

Orchids to the American Social Hygiene Association for the October, 1944, number of the Journal of Social Hygiene which presents a resume of the social hygiene campaign in the western hemisphere outside of the United States and Canada. The issue carries not only an excellent summary of venereal disease control efforts in the various countries but a thumbnail digest which makes it easy for those of us trying to stretch our understanding to include the hemisphere.

TWENTY YEARS OF UNDERWOOD IN MISSISSIPPI

Prophets are not always without honor in their own countries, as witness the Underwood issue, September, 1944, of *The Mississippi Doctor*, which is the monthly organ of the Mid-South Postgraduate Medical Assembly and the

Mississippi State Medical Association. In celebration of Dr. Underwood's 20 years as Mississippi State Health Officer and his presidency of the American Public Health Association, and presiding officer of its annual convention in October, 1944, Dr. Underwood's colleagues in Mississippi, in the South, and in the nation joined to pay tribute to his pioneering and leadership in public health.

These colleagues — Dr. Leathers, Dean of the Vanderbilt University Medical School, Dr. Ferrell, formerly of the Rockefeller Foundation, Dr. Parran, Surgeon General of the U. S. Public Health Service, and many others— remind us that (a) Mississippi, with the lowest per capita income in the nation, has more than four-fifths of its population under full-time local health service, (b) as early as 1924, the year when Dr. Underwood became Health Officer, Mississippi abolished its inadequate system of local public health agencies and created county or district health departments, (c) death rates from tuberculosis, malaria, pellagra, typhoid fever, and diphtheria have been halved, maternal and infant mortality rates have decreased about one-third, (d) in 1929 Mississippi became the fourth state to establish a division of industrial hygiene in the State Department of Health, its three predecessors having been the industrial states of Connecticut, Michigan, and Ohio, (e) the present war production on the Mississippi Gulf Coast is possible only because the health department has carried out sanitation following the methods of General Gorgas in the Canal Zone. "The 12,000 employees of the Ingalls Shipbuilding Corporation at Pascagoula are as free from tropical disease as if they lived in New York or Chicago." (f) A program of rehabilitation of men rejected for military duty because of venereal infection, whereby one-third of such rejectees were made available for military duty. In 1943, Mississippi led all states in the amount of anti-syphilitic drugs distributed by the State Health Department. It had also established three Rapid Treatment Centers.

These are but a few of Dr. Underwood's many achievements as Health Officer of Mississippi. Space forbids a similarly imposing list of his influence and achievements outside his own state. But we congratulate Dr. Ferrell on finding a happy phrase, "Public health statesman" to salute Dr. Underwood.

GO, AND DO THOU LIKEWISE

"A Hoosier, a birthright Quaker and a graduate of Whittier College, Jessamyn West was knocked down by tuberculosis while studying for her doctorate and had to make what she calls 'the horizontal approach to literature.' She has been writing sporadically for four or five years and has signalized her complete recovery by publishing three stories in the *Atlantic* since July of this year. But this, we feel, is only a beginning."

This is a footnote to a delicate and exquisite short story "Lead Her Like a Pigeon" by Miss West, published in the *Atlantic* for December, 1944. Her experience, about which by the way the story has nothing whatever to do, may encourage others facing months or years in bed to try "the horizontal approach" to literature or something else that will resolve their frustrations.

THE WAVE OF THE FUTURE

"The Wave of the Future," not a la Anne Morrow Lindbergh, but a la Maternity Center Association of New York is charted with accompanying colorgraphs in *Briefs*, the bi-monthly sheet of the Maternity Center Association. The past few years have seen a 25 per cent rise in the American birth rate, reaching its peak in 1943 and

already on its way down though still above normal.

This "wave" of babies first was felt in the overcrowding of obstetrical wards of hospitals, then baby carriage, diaper, and toy shortages. Soon schools will feel it, then later an abnormal number of new workers in industry, then a wave of marriages and new demands for homes and home equipment and then another wave of babies, and finally a wave of old age pensions and matured insurance policies.

But is this an ever-growing and expanding wave like the ripples in a pond? Alas, no, for after the peak of babies many of whom were "borrowed from the future," there will, like the inevitable pendulum that symbolizes human activities, be a downswing and then over-expanded maternity wards, schools, toy factories, yes, public health facilities, and abnormal distribution of youth and age will be here to haunt us. The Maternity Center Association concludes and advises: "This wave of the future must be closely studied by public health workers as they plan their services to meet community needs. Unless doctors, nurses, and public health administrators carefully watch this wave as it passes through the population, and adjust their services to rising and falling demands in certain age levels, the whole public health program can be gravely disorganized. Today is the time to prepare for this wave that is as surely on its way as tomorrow's weather."

SOME RECENT DEVELOPMENTS IN VD EDUCATION

By Radio in California

As recently as 1937 Dr. Thomas Parran was cut off the air when he spoke the word "syphilis." Six short years later, Radio Station KFI, in Los Angeles, in coöperation with the Los Angeles City, County, and California State public health departments was each Saturday evening giving a broadcast series entitled "The Unseen Enemy," a portrayal in dramatic form of the "human value, the despair, the tragedy and hope that are the hand maidens of venereal disease." A survey made after the first year of the series indicated a listening audience of nearly 100,000 persons, ranking it with the most popular broadcasts.

Late in 1944, thirteen of these radio dramas were published by the California State Department of Health, Wilton L. Halverson, M.D., Commissioner of Health, under the title "13 Against Syphilis." Some of the titles, "Syphilis Discovers Columbus," or "The Thrush Loses His Voice," give a glimpse of the quality of the dramas, far removed from moralistic lecturing. Several of the dramas are written in blank verse and all of them with taste and restraint. Permission for reproduction may be arranged through the California State Department of Public Health, 760 Market St., San Francisco 2, Calif.

By Advertising and Radio in Canada

In approximately 1,000 daily and weekly newspapers and selected magazines, the Canadian Department of National Health and Welfare carried on a six weeks' national advertising campaign against venereal disease at the end of 1944, the first of the kind in the country. Full page spreads with pictures and text were prepared based on the slogans, "Learn the Facts" and "Fight V.D. on the 4 Sector Front" (health, welfare, legal, moral). These were accompanied by suggestions for news articles of various kinds on venereal disease. At the same time the department prepared a series of nation-wide radio broadcasts to be supplemented with local broadcasts.

Not only did the campaign receive strong editorial support in the newspapers carrying the advertising, but many others who were excluded because

of the financial limitations of the campaign, expressed serious concern at their non-participation.

By Posters on Bus and Street Car in New York City

Savel Zimand, Director of Health Education of the New York City Health Department, tells of a new "first," the first time in the history of the department a message dealing with venereal disease was accepted and actually placed on display in transit lines. The first poster used for this milestone is a Kerry Drake comic strip warning against the venereal diseases as public enemies with deadly gangster guns. It is being displayed on street cars and buses of two of the boroughs of the city, Manhattan and the Bronx, and is considered a precedent-shattering event.

TWENTY YEARS OF CHILD LIFE SAVING

The *Statistical Bulletin* of the Metropolitan Life Insurance Company for January, 1945, reviews 20 years of progress in the saving of lives of children between the ages of 5 and 14, as reflected among such youngsters insured in the Industrial Department of the Metropolitan.

Among the findings reported in this summary is that, for every two children who die under current mortality conditions, five would have died if the death rate of only two decades ago had continued to prevail. This marked improvement has benefited each color and sex group, but not in equal measure; white children showed a larger reduction than Negro and girls did better than boys. The mortality among white girls at ages 5 to 14 is now at the remarkably low point of less than one per 1,000.

The most spectacular gains between 1922–1923 and 1942–1943 have been scored against the principal communicable diseases of childhood, which showed a reduction of 93 per cent for the children of grade school age. The largest decrease was reported for diphtheria, the only disease in this group for which effective means of prevention and treatment have been available for the entire period. At present the death rate from diphtheria among this group of insured children is only one-twenty-sixth of what it was 20 years ago; as a result, the disease has been reduced from one of the principal causes of death of school age children, to one of wholly minor importance. A 90 per cent decrease in scarlet fever mortality and an 80 per cent decrease in both whooping cough and measles mortality have taken place during the same period.

Death rates from tuberculosis and pneumonia have decreased by three-fourths in the 20 years, the latter having been accelerated since 1937 when chemotherapy began to be used on a wide scale. A decrease of 70 per cent in the appendicitis mortality rate is attributed to the use of the sulfa drugs in cases complicated with peritonitis, to advances in surgical technique, and to an educational campaign, in which the public has been urged to seek medical care without delay and to avoid the use of laxatives in the case of abdominal pain.

Although rheumatic fever and its frequent end result in childhood, organic heart disease, recorded a drop of three-fifths in mortality over the 20 year period, rheumatic fever ranks first among diseases causing death at ages 5 to 14 and is a leading cause of disability and of death in early and middle life.

The death rate from accidents among children of elementary school age has been cut almost in half. This reduction has yielded a large dividend in lives saved, since accidents were and continue to be the leading cause of death at these ages. Automobile accidents, as a cause

of death, decreased 52 per cent among children during a period when the death rate from this cause for the total population was practically stationary. There was a noteworthy drop of 70 per cent in the death rate from burns and scalds, the leading class of fatal home injuries among youngsters, and of 50 per cent in the mortality from accidental falls. Safety education, modernization of homes, and greater attention to the care of young children are all thought to have contributed to the greatly reduced toll from accidents.

Mortality rates at the school ages have fallen to such low levels that the possibilities of further reduction are limited. Future progress depends upon the development of measures to prevent or control rheumatic fever, upon wiping out what remains of tuberculosis at these ages, and upon accident prevention. But, as the summary also points out, mortality statistics are at best an indirect criterion of the state of health of any group. We do not yet know how healthy are those who live and how successful we have been in not only preventing deaths of children but bringing them to adolescence and maturity without physical or mental disability and without disabling chronic diseases. In this area the challenge of the future lies.

With the same issue, the *Statistical Bulletin* embarks upon a second quarter of a century of publication. The Metropolitan and Dr. Louis I. Dublin are to be congratulated on this long history of notable public service.

WORTH ACQUIRING

"Your Stake in Community Planning," with lively, humorous illustrations and no—well, almost no—technical terms is the popular version of "Neighborhood Design and Control" by the National Committee on Housing. It attempts to give the average nontechnical citizen the facts about city and neighborhood planning and how it can affect his work and home surroundings. It is an interesting illustration of an approach that treats the citizen as an adult, rational being, interested in and able to influence the environment in which he and his family live. Available from National Committee on Housing, Inc., 512 Fifth Avenue, New York. Price, $.35.

"Ideas for Teachers," Fall Motion Picture issue of 1944 has a comprehensive list of films for use in health education in elementary and secondary schools and other groups, with full instructions, sources, and prices. It represents a great deal of staff research and evaluation by the Nassau County Tuberculosis and Public Health Association, 1565 Franklin Ave., Mineola, N. Y.

"The society which fosters research to save human life cannot escape responsibility for life thus extended. It is for science not only to add years to life, but more important, to add life to the years." With this quotation from Drs. Piersol and Bortz defining geriatrics, "Borden's Review of Nutrition Research" devotes its March, 1945, issue to Nutrition in Geriatrics. It contains a discussion of the relation of nutrition to the life span, the nutritional requirements of the aged, dietary suggestions, and findings of some experimental studies in the diet of the aged. It ends with this hope, "The increased longevity of man may be made an incalculably valuable advance if health and vigor can be retained. . . . The reward may be the dawning of a new era of intellectual conquest, for man may then live long enough to think." This pamphlet can be secured from The Borden Company, 350 Madison Ave., New York 17, N. Y.

A folder on patients' education in tuberculosis hospitals produced by the

Bronx Tuberculosis and Health Committee, 226 E. Fordham Road, Bronx, N. Y., which has grown out of first-hand contact with tuberculous patients, includes a brochure, "Facts the Tuberculous Patient Should Know," and a series of letters for newly admitted tuberculous patients. Miss Gladys A. Adams and Miss Evelyn M. Rhodes are responsible.

"When He Comes Back" and "If He Comes Back Nervous," two talks to families of returning servicemen which should have wide usefulness, have recently been published by the Rehabilitation Division of the National Committee for Mental Hygiene, 1790 Broadway, New York 19, N. Y. (Price $.15). They try to give families some picture of the emotional and psychological adjustments the returning soldier must make because of the war horrors he has seen, the disabilities he has suffered, or the lack of civilian understanding he has experienced. Parents and wives and friends are told what he needs in sympathetic understanding without pity, in listening with interest but without prying, in facing but not ignoring his disability. Not the least of its values is a chart showing "Where to go for what," or advice on the use of community resources, and a bibliography of pamphlets and books on the subject of the returning service men and where they can be secured.

In this connection one might also mention the series on "The Church and Returning Service Personnel" published or in preparation by the Federal Council of Churches of Christ in America, 289 Fourth Ave., New York. Among the titles already completed are "Attitudes and Problems," "Counselling to Meet the Needs," "Welcoming the Wounded," and "Government Plans for Demobilization." Soon to be released is "How Families Can Help."

The Free World Association of Hollywood, 213–14 Taft Building, Hollywood 28, Calif., has just published a list of 16 and 25 mm. motion picture sound films of the United States and other United Nations catalogued as to where and how they can be secured. If the list has a common theme it might be something like "understanding ourselves and our neighbors all over the globe." Among its titles are Pare Lorentz's incomparable "The River," "Children of China," "Dover," "The Dutch Tradition," "Grain That Built a Hemisphere," "Housing in Chile," "World Down Under," "Men of Medicine," "Life Begins Again," "Negro Soldier," and "Saludos Amigos," to mention only a few at random. Use of the films is suggested by all groups "who understand that the fight for peace must be waged as relentlessly as the battle of war."

The National Live Stock and Meat Board, 407 South Dearborn Street, Chicago, has prepared an "Elementary School Nutrition Teaching Kit" consisting of a nutrition reader, "You and Your Engine," a 32 page book illustrated with colored pictures and designed for children in the middle grades, and posters, work charts, and a teacher's manual. It is encouraging to see that the Meat Board has faith in the future of meat in spite of its present absence from what used to be known as a "groaning board."

"Social Hygiene News and Views," the monthly bulletin of the District of Columbia Social Hygiene Society, continues to have a special quality of making essential social hygiene material interesting.

"THE CAPACITY FOR COURAGEOUS WRATH"

The Cleveland Child Health Association at its recent 16th annual meeting

recognized the 65th birthday of Richard A. Bolt, M.D., Dr.P.H., the Director. One of his associates when asked what was the most outstanding trait of the man who was being honored said that Dr. Bolt, to a larger extent than any other man of his acquaintance, had the capacity for courageous wrath. Not anger against wrong done himself but against injustices to other people, especially mothers and children. Among the other speakers, Congresswoman Frances Payne Bolton of Cleveland paid tribute to Dr. Bolt as a prophet who was not without honor in his own country. Dilworth Lupton, in his column in the *Cleveland Press* regarding Dr. Bolt, quotes Marriner S. Eccles, chairman of the board of governors of the Federal Reserve System, in warning us that "in the post-war economy the sort of deficit we should fear most is not financial but human."

Dr. Bolt presented "a blueprint of a new era for maternal and child health in Greater Cleveland."

PUBLIC HEALTH ENGINEERING IN THE FOOD INDUSTRY

Something new and of considerable significance in the field of sanitation is the employment by the National Biscuit Company of a sanitary engineer from the public health field. J. Lloyd Barron, C.E., a pioneer in local environmental sanitation work, leaves Nassau County, New York, where he has been County Sanitary Engineer for seven years, to undertake the establishment of a sanitary control of the food processing and storage plants of this major food industry.

The significance lies in the recognition by an outstanding industry that the application of the science and art of sanitation to a huge food operation deserves a separate and independent controlling agency within the organization having sanitation as its primary interest. Too long food sanitation has been an incidental concern, subordinate to other objectives of the food processor.

It has been the general practice for the food industry to receive its policing from the outside at the hands of federal, state and local authorities. Here is an instance of a large food concern undertaking its own policing and starting the project with a technically qualified person from the public health field. It is a step which should be welcomed by all food control agencies.

Furthermore, this action is in line with post-war plans of many local health jurisdictions, notably New York City, to require the employment by the larger food handling concerns of personnel who have received special training in the sanitary protection of foods, and to whom is delegated the responsibility for sanitation within the establishment. The prospect is presented not only of progressively higher standards of food quality, wholesomeness, and safety, but of coöperation between the food industry and food regulatory authorities on the basis of a technical approach to the complex problems of food sanitation.

POSTERS FOR RESTAURANT SANITATION

The Association is in receipt of a series of 6 posters presented in the interests of restaurant sanitation by the U. S. Public Health Service, Washington, and printed by the U. S. Government Printing Office. It is the RS series, numbers 1 to 6. Each of these posters carries the caption ". . . for our patrons' health" and they relate to hand washing, to the handling of food and utensils in proper manner, to the refrigeration of perishable foods, the protection of foods from dust and spray, and to the thorough washing of dishes. The series is for sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

BOOKS AND REPORTS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

All books reviewed in these columns may be purchased through the Book Service.

Lead Poisoning — *By Abraham Cantarow, M.D., and Max Trumper, Ph.D. Baltimore: Williams & Wilkins,* 1944. 264 pp. Price, $3.00.

This fine book is of especial interest to all workers in public health, particularly in the field of industrial hygiene. As the authors state, "Lead poisoning is almost exclusively an occupational disease, instances of accidental or non-industrial plumbism being encountered but occasionally in this country."

The authors have succeeded in bringing together and coördinating the available data on this subject; whenever possible, they have made known their considered opinions. The volume includes chapters on the absorption, transportation, deposition, and excretion of lead; pathology and pathological physiology; chemical manifestations; lead in blood, body fluids, and excretions; normal intake; treatment; occurrence; lead products; and analytical procedures for the determination of lead. There are also a bibliography, index, and tables. The chapter on the Treatment of Lead Poisoning was written by May R. Mayers, M.D., and the chapter on Analytical Procedures is the work of M. B. Jacobs, Ph.D.

The book is well cross-referenced. Printers' errors are relatively few. On page 19, "triethyl lead" should read "tetraethyl lead."

There is a logical presentation and fine correlation of the material. The authors have recognized the importance of precision in analytical procedures in the evaluation of data obtained by different investigators, and the need for accurate analytical methods as a basis. Under Lead Products in Industry, the authors discuss in considerable detail the lead hazard in the storage battery industry; particular emphasis is placed upon the control of this hazard. The section on Analytical Procedures includes most of the recognized methods of analysis, but does not give a good evaluation of the procedures which are described. This reviewer takes exception to some of the recommendations concerning the collection of air samples. Size of samples should not be based upon the ease of subsequent analytical manipulations and calculations but rather on the nature of the particular operation and fluctuations in the environment. Exception is also taken to the statement on page 219 that "these methods (of analysis) are approximately equal in sensitivity and precision."

Some of the directions in the procedures which are described are at variance with recommendations in the recently published A.P.H.A. *Report on Methods for Determining Lead in Air and in Biological Material.* It is unfortunate that this report was not available at the time this book was written.

The authors have made a valuable contribution to the literature on plumbism, and this volume is, therefore, highly recommended to all those interested in occupational disease and industrial medicine. F. H. GOLDMAN

Employment Opportunities in Public Health—*Coöperatively prepared for Employment Counselling Agencies by the Committee on Professional Education of the American*

Public Health Association and the U. S. Public Health Service. New York: American Public Health Association, 1945. 30 pp. Free.

Condensed in this brief compass are the outlines of positions in public health in a form suitable for use of the vocational counsellors dealing with those who leave the armed services and seek careers of various sorts. This is a coöperative venture by the Association and the U. S. Public Health Service, and covers the essential features of the Association's officially adopted statements about qualifications for health officers, for engineers and sanitarians, for dentists, school physicians, medical administrators of specialized health activities, public health laboratory workers, health educators, industrial hygienists, executives of voluntary health associations, nutritionists, public health nurses and nurses in industry. The last two were prepared in coöperation with the National Organization for Public Health Nursing. Institutions in North America offering graduate degrees and certificates in public health and in sanitary engineering and public health nursing are listed. Dr. William P. Shepard, Chairman of the Committee on Professional Education, is to be congratulated for the way in which this booklet is pointed up to the non-technical person, either with or without a college education, who is planning his life work. REGINALD M. ATWATER

Fundamentals of Internal Medicine—*By Wallace Mason Yater. (2nd ed.) New York: Appleton-Century,* 1944. 1152 pp. Price, $10.00.

This book is a composite of scientifically established facts in the field of internal medicine and the personal clinical impressions of the author, and at times the latter are in conflict with the former. It is unfortunate that the book is not written so that these two types of information could be separated. This is not a good book for the medical student since he would be unable to differentiate between them. It is a book which might be read by those specialists in internal medicine who are interested in learning the clinical impressions of the author. The bibliography in the book is practically entirely limited to references to other textbooks and not to source material.

The book would be more valuable and would serve the purpose for which it was designed if the statements which are based on scientific observation were properly documented by reference to original source material.

DAVID D. RUTSTEIN

Enrichment of Flour and Bread—*Prepared by Russell M. Wilder, M.D., and Robert R. Williams, Sc.D. Washington, D. C.: National Research Council, National Academy of Sciences,* 1944. 130 pp. Free (limited quantities).

The key to this bulletin is to be found in the preface. Its purpose is said to be the furnishing of information necessary for leaders who wish to promote the introduction of enrichment legislation into the 1945 sessions of state legislatures. Accordingly more than half the space is given over to a report of the experience in launching the movement for enriching white flour and white bread, first through the voluntary action of the milling and baking industries, and more recently through the Federal War Food Order covering bread and rolls, and through permanent legislation by six states. The later sections of the bulletin deal chiefly with the public health basis for enrichment of bread and flour in relation to other nutritional reforms, which, although worthy in themselves, do not seem to the Food and Nutrition Board as urgent on a country-wide scale or as simple of accomplishment.

The case for enrichment is presented

in detail and with persuasiveness. But in a publication from a disinterested scientific body, it seems out of place to quote, with apparent approval, Jolliffe's highly vulnerable statement that the enrichment of 75 per cent of New York City's bread supply has been accompanied by a marked decrease between 1938–1939 and 1942–1943 in the incidence of florid pellagra and florid beriberi among Bellevue Hospital patients. MARJORIE M. HESELTINE

An Outline of Tropical Medicine—*By Otto Saphir, M.D. Chicago: The Michael Reese Research Foundation,* 1944. 85 pp. Price, $1.00.

The current enthusiasm for tropical medicine appears to encourage the publication of shorter and shorter treatises to familiarize the medical profession with this field. This little book has been prepared for the attending and house staff of Michael Reese Hospital. It is described by the author as "an extended vocabulary of Tropical Medicine." The information presented was gleaned mainly from textbooks and from a brief period of study at Tulane University. Most of the statements are accurate, but there are a number of errors of omission and commission as one would expect. The book may be of some value as a pocket reminder of tropical medicine but cannot be recommended for general use.

HENRY E. MELENEY

The Etiology, Diagnosis, and Treatment of Amebiasis—*By Charles Franklin Craig, M.D. Baltimore: Williams & Wilkins,* 1944. 332 pp. Price, $4.50.

This is essentially a new edition of the author's book *Amebiasis and Amebic Dysentery,* published in 1934, rewritten to include all the important information acquired since that time. There is no one better qualified than Colonel Craig to publish on this subject. His former book was received as authoritative, and the new edition is even better because of its completeness.

In addition to the subjects included in the title, the book contains chapters on epidemiology, pathology, symptomatology, and prevention. The chapters on diagnosis include the differential diagnosis from other intestinal protozoa as well as microscopical, cultural, and serological examinations.

The book is well illustrated with photographs and line drawings, and is in excellent format. It should be in every medical and public health library and laboratory, and in the hands of practitioners who deal with intestinal infections. Its publication is timely because of the increased importance of amebiasis during and after the war.

HENRY E. MELENEY

Demographic Studies of Selected Areas of Rapid Growth—*New York: Milbank Memorial Fund,* 1944. 158 pp. Price, $1.00.

This volume includes seven papers presented at the Round Table on Population Problems of the Twenty-Second Annual Conference of the Milbank Memorial Fund. Population problems with consideration of mortality, fertility, and migration in Japan are discussed by Irene B. Taeuber and Edwin G. Beal; in India by Kingsley Davis; in Eastern and Southern Europe by Wilbert E. Moore; in the Near East by Ernest Jurkat; in Egypt by Clyde V. Kiser and W. Wendell Cleland. The seventh paper by Frank W. Notestein, Chairman of the Round Table, is concerned with the problems of policy in areas of heavy population pressure.

These population experts have assembled available data from reports of population, births and deaths for the study of past and future trends of growth. In many areas the data are extremely limited. It is evident that satisfactory methods of recording these

vital facts should be established for accurate determination of population problems which affect the peace and prosperity of the world.

According to the authors, as public health measures are introduced and further reductions in mortality are made, the growth of population may be accelerated. In certain areas, birth rates are high and declines in birth rates are less rapid than the declines in death rates. With the rapid growth of populations in areas unable to support such increases, serious population problems may develop.

The authors describe the problems in selected areas of the world and discuss certain solutions through migration, reduction of the birth rate, industrialization, etc. Investigations such as these are essential for the study of the problems over the world and for the development of satisfactory policies for peaceful methods of adjustment.

RUTH R. PUFFER

Emotional Hygiene—*By Camilla M. Anderson, M.D. Philadelphia: Lippincott*, 1943. 249 pp. Price, $2.00.

Before the war there was an expectant feeling among public health workers that Mental Hygiene was "standing in the wings ready to make its entrance on the stage" as the next major effort of concerted public health activity. Intervening events have served to add a more insistent note to the entrance cue. Books such as the one under review are therefore timely, and should be on the reading lists of all forward looking public health workers.

The value of this volume is out of proportion to its size. The fact that it is written in part especially for nurses, with a chapter devoted to problems met by public health nurses and social workers, does not detract from its value to all who are eager to attain for themselves the insight necessary for happier and more effective living. The book is written in clear, simple language, enriched by illustrations from real life and lightened by appropriate veins of humor. Best of all, it bears throughout the stamp of a reverent and intellectually honest attitude toward those embarrassingly intimate mysteries of early personality development from which spring at some later time most of the emotional pitfalls of infantilisms, regressions, insecurities, evasions, imperfect emancipations, and other inadequate emotional adjustments to life.

Understanding emotional difficulties through a knowledge of their developmental components is the central theme of the book. Because progress in the field of mental hygiene, as in all aspects of public health, depends so largely on the knowledge and attitudes of the general public, to get the understanding contained in this small volume into the popular thought stream becomes an important duty of public health workers. Reading this small volume is not laborious, far from it. But even if it were, the labor would be well spent.

PAUL H. STEVENSON

Fundamentals of Bacteriology—*By Martin Frobisher, Jr. (3rd ed.) Philadelphia: Saunders*, 1944. 824 pp. 398 illus. Price, $4.00.

The Third Edition of Frobisher's *Fundamentals of Bacteriology* has been reorganized completely and presents an excellent refutation of the statement that a textbook can become outdated between editing and publishing. The up-to-dateness of this textbook is reflected from the colored frontispiece of *Penicillium notatum* on through the newly added material on: cultivation in chick embryos, penicillin, viruses; poliomyelitis, lymphogranuloma venereum, light, electron and fluorescence microscopy, tissue cultures, gramicidin, bacteriophagy, sulphonamide drugs, Rickettsiae, vitamin assay.

Much of the taxonomy of the 2nd edition has been reduced or eliminated, which will be welcomed by those beginning the subject. This phase of bacteriology is amply covered, however, in the chapters on Classification and Systematic Study. The 824 pages of the text include about 400 instructive illustrations (some in color) which clearly augment the text and ought to stimulate the imagination of both the student and perhaps the teacher. A careful perusal of the illustrations alone might serve well as the core of a super-accelerated course. Each chapter is followed by an essential bibliography of late date which not only covers the details of the printed text but should stimulate reading far beyond the covers of the book.

It is pleasing to note that the chapters on the too-often-neglected or too-often-omitted Higher Bacteria are retained for the edification and broadening of the students of the True Bacteria. The cultivation, classification and industrial applications of the yeasts and molds are adequately covered, together with the bacteriology of air, water, milk, and soil. The chapter on the Industrial Applications of Bacteriology is well written and illustrated. It should be of great interest and value to those students whose future lies along that particular groove. The History of Bacteriology and the Place of Bacteria in the World still retain their fine orientation value.

Some teachers might disagree with the sequence of the chapters, reasoning, for instance, that chapters 19–21 on Enzymes and Metabolism should precede chapters 14–18 on Disease and Immunology. This superficial criticism could be easily overcome by a little scientific island-jumping in the assignments.

This easily read volume is printed in clear type and on good paper. The index seems well arranged, complete and workable. Both Dr. Frobisher (scientifically) and the Saunders Company (mechanically) are to be congratulated on the presentation of this well groomed textbook in these troublesome times. Undoubtedly it will become a much used standard text in all fields of bacteriology.

WILLIAM W. BROWNE

Foster Home Care for Mental Patients—*By Hester B. Crutcher. New York: The Commonwealth Fund,* 1944. 199 pp. Price, $2.00.

Public health nurses will be interested in Miss Crutcher's book for three good reasons.

1. They see homes where mental patients of the type suitable for foster care can be successfully placed.

2. They occasionally have the responsibility of supervising such cases for mental institutions. Such assignments will probably increase after the war.

3. They need to know the attitude of the institution and the trends in foster home care to be able to answer questions from families and others.

The first six chapters are especially recommended and, if time presses, chapters 3–6 (Family Care as a Therapeutic Procedure, Selection of Patients, Selection of Homes and Supervision of the Patient) contain the most important facts for public health nurses to know. The material lends itself unusually well to staff discussion in a field of growing significance to public health nurses.

DOROTHY DEMING

Food Regulation and Compliance, Vol. I—*By Arthur D. Herrick. New York: Revere Publishing Company,* 1944. 646 pp. Price, $10.00.

This book is primarily designed to assist the producer and the distributor in his efforts to comply with the present Food, Drug, and Cosmetic Act if he is engaged in interstate commerce or en-

gaged in intrastate commerce in any of the states which have adopted a similar act. The historical references to this Act and its predecessors are accurate and are of interest to food inspection officials as well as to the manufacturers or wholesalers.

In preparing the body of this work the author has utilized the Trade Correspondences of the present U. S. Food Administration as well as the Service and Regulatory Announcements and the Food Inspection Decisions of the old Bureau of Chemistry. He quotes extensively from decisions of the courts as found either in the notices of judgment of the department or elsewhere. One chapter is devoted to labels and labeling, and points out very clearly the difference between these two words as maintained in the Act. This chapter covers only ten pages but the next two chapters, entitled "False and Misleading Statements," cover one hundred pages with more than two hundred references, many to court decisions upon the various phases under discussion. The chapter on special dietary foods covers sixty-two pages, giving an accurate although much abbreviated dissertation upon the vitamins, including sources of these substances and the loss on storage, canning, freezing, and dehydrating.

The food inspection official can look over this book and ponder upon the almost insurmountable difficulties this new law has placed upon the manufacturers, and yet, except in a few instances, the manufacturers have been unusually successful in complying.

Mr. Herrick must have spent considerable time in gathering the data for this volume and has presented them in very clear and understandable English. The book is well indexed. It should be on the shelves of all manufacturers and wholesalers of products covered by the U. S. Food, Drug, and Cosmetic Act.

HERMANN C. LYTHGOE

Family Health Service in Tuberculosis—*New York: Community Service Society, Department of Educational Nursing*, 1944. 47 pp. Price, $.50.

As a supplement to more formal nursing instruction in tuberculosis nursing, this little pamphlet would seem to fill a definite need in the public health nursing field. The series of well chosen pictures and brief explanatory notes illustrate the various phases of home care of the tuberculous, including hospitalization of the patient, instruction and examination of the household contacts. In most communities it is not possible for the public health nurse to follow the patient in the sanatorium as closely as indicated, but the idea of continuing local responsibility for the hospitalized patient is desirable. This booklet should be of distinct value to the board of health nurse or visiting nurse charged with supervision of tuberculosis patients in their homes.

ALTON S. POPE

Global Epidemiology: A Geography of Disease and Sanitation—*By Simmons, Whayne, Anderson and Horack. Philadelphia: Lippincott*, 1944. 504 pp. Price, $7.00.

The word "epidemiology" has been used to cover a multitude of sins and here it has been made global in scope. The real value of this book can be appreciated only if its principal title is forgotten. It is not an epidemiology but, as its subtitle states, "a geography of disease and sanitation." Part I deals with India and the Far East, and Part II with the Pacific Area. For each area there is an outline of the geography and climate and then a series of sections usually as follows: first, the form of local health administration; second, sanitary conditions of water supplies and facilities for sewage disposal; third, medical and hospital facilities, including data on hospital size, equipment, availability of drugs,

vaccines, x-ray, dental and nursing service, etc.; fourth, the occurrence of various diseases, their distribution, etiological agents, vectors, control programs, etc.

Many chapters also contain information on poisonous snakes, fishes, arthropods of medical or economic importance, and other animal and plant life affecting human welfare. Many sections include surveys of native foods and dietaries, as well as notes on the availability of other foods, both domestic and imported. Curious native habits such as betel-nut chewing and drug addictions are also mentioned occasionally.

The disease distributions are abundantly illustrated by schematic maps. At the end of the discussion of each area, there is a general summary in nontechnical language of the most significant points of the survey, and a bibliography. Specific recommendations are made as to measures to be taken to avoid the health hazards peculiar to the area in question.

To place this book in proper perspective, it is necessary to understand its evolution. The material upon which it is based originated with a series of surveys conducted by the Medical Intelligence Division, Preventive Medicine Service, Office of The Surgeon General, U. S. Army, the purpose of which was to gather information which would be of value in planning the health protection and medical care of troops engaged in this global war. At first the areas selected were those of immediate military importance. Later the interest was extended to those countries which were of potential or possible importance. Material was collected by a large number of individuals, working more or less independently and utilizing every available source of information—libraries in various parts of the country, files of governmental departments and of private agencies, interviews with persons who had traveled through or lived in the areas under consideration, etc.

Recognizing the potential value of this material, the Committee on Information of the Division of Medical Sciences of the National Research Council proposed that the original surveys be published after reëditing to remove all material the release of which might be inadvisable at this time. The present volume is the initial result of this proposal. In the words of the authors,

> . . . no one can be as aware of the limitations of such a volume as those who have labored over it. Much of the material has been gathered under the impelling whiplash of speed. Military operations do not wait for painstaking scholarly research. . . . This book is thus released with full knowledge of its many inadequacies but in the hope that the material so contained will be of such value that those who labored on it will be forgiven for their errors, and that it may serve as a basis on which more extensive studies of *geomedicine* may be built in the reconstruction period to follow the present holocaust.

In the opinion of the reviewer, the authors are too humble in asking forgiveness. Such an ambitious project as a description of the medical ecology of all parts of the world must inevitably be full of errors and omissions in its embryonic state. On the other hand, to bring together in orderly presentation this wealth of useful information gathered from diverse sources, many of which are not ordinarily accessible, is an accomplishment worthy of praise. It is the signal recognition that in medicine as well as in politics and commerce, human relationships have expanded from the international into the global concept.

KENNETH F. MAXCY

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed in future issues.

ADVANCES IN ENZYMOLOGY AND RELATED SUBJECTS OF BIOCHEMISTRY. Edited by F. F. Nord and C. H. Werkman. New York: Interscience Publishers, Inc., 1944. Vol. IV. 332 pp. Price, $5.50.

BACTERIAL INFECTION. WITH SPECIAL REFERENCE TO DENTAL PRACTICE. By J. L. T. Appleton, Sc.D. 3rd ed. Philadelphia: Lea & Febiger, 1944. 498 pp., illus. Price, $7.00.

BIBLIOGRAPHY OF INDUSTRIAL HYGIENE 1900–1943. Compiled by Ellen F. Bellingham, J. J. Bloomfield and Waldemar C. Dreessen. Washington, D. C.: U. S. Gov. Ptg. Office, 1945. Public Health Bulletin No. 289. 95 pp. Price, $.20.

CONSCIENCE AND SOCIETY. A Study of the Psychological Prerequisites of Law and Order. By Ranyard West, M.D. New York: Emerson Books, Inc., 1945. 261 pp. Price, $3.00.

CONSTITUTION AND DISEASE. Applied Constitutional Pathology. By Julius Bauer, M.D. 2nd ed. New York: Grune & Stratton, 1945. 247 pp. Price, $4.00.

DOCTORS AT WAR. Edited by Morris Fishbein, M.D. New York: Dutton, 1945. 418 pp. 82 illus. Price, $5.00.

LEARNING THROUGH EXPERIENCE IN FAMILY HEALTH WORK. A Report of Student Participation in the East Harlem Nursing and Health Service Program, 1928–1941. New York: National Organization for Public Health Nursing, 1944. 103 pp. Price, $.10.

MANUAL OF CLINICAL MYCOLOGY. Prepared under the Auspices of the Division of Medical Sciences of the National Research Council. Philadelphia: Saunders, 1944. 348 pp. 148 illus. Price, $3.50.

A MANUAL OF TROPICAL MEDICINE. Prepared under the Auspices of the Division of Medical Sciences of the National Research Council. Philadelphia: Saunders, 1945. 727 pp. 284 illus. Price, $6.00.

MASS RADIOGRAPHY OF THE CHEST. By Herman E. Hilleboe, M.D., and Russell H. Morgan, M.D. Chicago: The Year Book Publishers, Inc., 1945. 288 pp. Price, $3.50.

MEDICAL CARE SERVICES IN NORTH CAROLINA. A Statistical and Graphic Summary. Prepared for the North Carolina Commission on Hospital and Medical Care by the Department of Rural Sociology, North Carolina Agricultural Experiment Station. Raleigh: North Carolina Agricultural Experiment Station, 1945. 90 pp. Free from publisher.

MICROBIAL ANTAGONISMS AND ANTIBIOTIC SUBSTANCES. By Selman A. Waksman. New York: The Commonwealth Fund, 1945. 350 pp. Price, $3.75.

MY SECOND LIFE. AN AUTOBIOGRAPHY. By Thomas Hall Shastid, M.D. Ann Arbor: George Wahr, Publisher, 1944. 1174 pp., illus. Price, $10.00.

NOTES ON NURSING BY A NURSE. By Sarah Corry, R.N. New York: D. Appleton-Century, 1944. 144 pp. Price, $1.50.

NURSING. A PROFESSION FOR COLLEGE WOMEN. New York: Nursing Information Bureau of the American Nurses' Association, 1945. 35 pp. Price, $.25.

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A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Blot **in Public Health's Escutcheon**—During the first four weeks of the year, 1,384 cases of diphtheria were reported. This number is above the 5 year median, and increases over the preceding year occurred in all sections of the country except the East North Central region.

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As **Important as Bullets**—Fighting as we are in every disease-ridden corner of the earth, knowledge of the medical hazards that exist and the local resources available to help meet them becomes a military "first." This story of the varied sources from which come all the minutiae of information will open the eyes of the reader.

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tially a dramatization of the present-day No. 1A public health problem. There are twelve more papers so challenging that our rule of "items from periodicals only" is broken to bring them to your attention.

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Airing Our Nutritional Ignorance—Neither the most satisfactory level of intake nor the optimal retention of any nutrient is known. Current efforts to plan national food policies and the interpretation of dietary surveys based on "standard requirements" may lead to serious error, concludes this Canadian critic.

PETT, L. B. Errors in Applying Nutrient Allowances to Dietary Surveys or Food Policies. Canad. Pub. Health J. 36, 2:69 (Feb.), 1945.

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600,000 Pathologic Drinkers—If alcoholism is a concern of public health, and I cannot see how that assumption can be refuted, then it is imperative that you read this paper. One quotation: "What the Alcoholics Anonymous movement needs is a closer coöperation with the medical profession, and what the medical profession needs *even more* is a closer coöperation with Alcoholics Anonymous" (italics ours).

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ASSOCIATION NEWS

STATE HEALTH CONFERENCES—1945 PATTERN

The success of a series of state health meetings under the auspices of state public health associations during 1943 and 1944, which were attended by a team of speakers organized under the auspices of the American Public Health Association, has created a demand for similar meetings in 1945. This matter has been repeatedly considered at length by the Executive Board of the A.P.H.A. and the Executive Secretary has been directed to attempt to meet the manifest need for professional refresher courses within the limits on such meetings this year.

In spite of the fact that regular state meetings cannot be held for this purpose under the current orders of the Office of Defense Transportation, several of the western states have planned during May and June to have select conferences of persons who stand to gain most from such opportunities and so far as possible aim to bring new information and stimulation to public health workers in isolated places. These sessions have been planned under circumstances so that the rules of the ODT will be strictly observed and not more than fifty persons will travel by means of public conveyance or use hotel rooms. Around most of these centers a considerable number of other persons can find ways to attend without the use of public transportation.

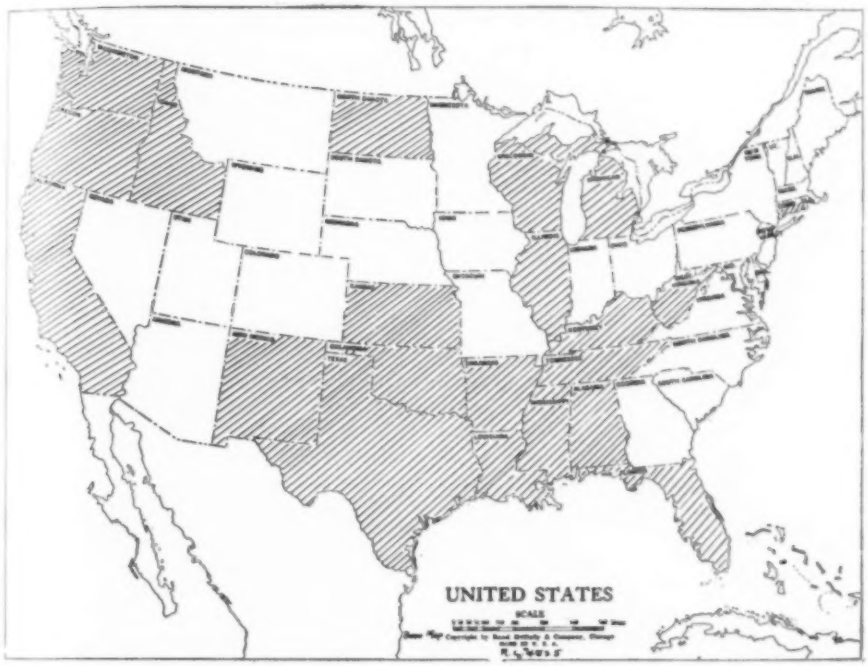
As we go to press, nine meetings have been planned as follows: May 16, Chicago, Ill.; May 17, Springfield, Ill.; May 18, St. Louis, Mo.; May 19, Kansas City, Mo.; May 21, Topeka, Kans.; May 22, Wichita, Kans.; May 23–24, Denver, Colo.; May 28–29, Salt Lake City, Utah; May 31–June 1, Boise, Idaho.

In each case the meetings will be under the auspices of the respective state public health associations who will be responsible for all arrangements and the program. The traveling team will include for the first six meetings James G. Townsend, M.D., Director Industrial Hygiene Division, National Institute of Health, Bethesda, Md.; George M. Wheatley, M.D., Assistant Vice-President, Welfare, Metropolitan Life Insurance Company, New York; Frank Stafford, M.A., of the U. S. Office of Education, Washington; Ruth Fisher, R.N., Associate Director, National Organization for Public Health Nursing, New York; and Reginald M. Atwater, M.D., Executive Secretary, A.P.H.A.

The meetings in Colorado, Utah, and Boise will be attended by Dr. Townsend, Dr. Wheatley, and Dr. Atwater, and, in addition, by Karl F. Meyer, M.D., Director, Hooper Foundation, University of California, San Francisco; Fred T. Foard, M.D., District Director, U. S. Public Health Service, Denver; and Ruth Freeman, R.N., Director, Course in Public Health Nursing, University of Minnesota, Minneapolis.

It is desirable that persons living outside of the cities where these meetings are scheduled and who desire to attend should communicate with the respective secretaries of the state public health associations to confirm the dates and arrangements and to make sure that the quota of those who travel will not be exceeded.

INDICATED STATE HEALTH DEPARTMENT PARTICIPATION IN THE PROMOTION OF EVALUATION OF LOCAL HEALTH SERVICE



The development of a Reporting Area for Health Practices as described in the issues of the JOURNAL for October, 1944, and March, 1945, has enlisted the interest of 21 states at this writing (April 6). State health departments in the 21 states shown in the above map have indicated the desire to participate actively in encouraging the submission of *Evaluation Schedules* from local areas. Communities whose schedules contain adequate material, will be listed in the next annual edition of *Health Practice Indices*, as constituting the Reporting Area for Health Practices. Additional indicated participating areas are Hawaii, the Virgin Islands, a number of communities in the Canadian Provinces, and individual communities in states other than those shown on the map.

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The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

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Eunice M. Moore, Ph.D., 2500 S. Dearborn St., Chicago 16, Ill., Research Chemist, Bauer and Black

Charles A. Siler, M.D., 1140 Lake St., Oak Park, Ill., Commissioner of Health

CLOSING DATE FOR ACCEPTING FELLOWSHIP APPLICATIONS FOR 1945 ELECTION

The Administrative Office has already announced through the A.P.H.A. *Newsletter* that the annual election of Fellows, Life Members, and Affiliated Societies will take place this fall, although the present forecast is for no Annual Meeting in 1945. The closing date for accepting Fellowship applications for 1945 election will be August 1, and members interested in applying for such affiliations are urged to submit their applications as much in advance of this date as possible.

PUBLIC HEALTH EDUCATION SECTION

The officers of the Section regret the omission of the following Committee of the Section from the Committee List as it was published in the April *Journal* (page 404):

Committee on Health Education in Hospitals, Out-Patient Departments and Clinics

W. W. Bauer, M.D., *Chairman*
Bruno Gebhard, M.D.
Henriette Strauss

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York 19, N. Y.

Positions Available

(Supplemental to lists in recent Journals)

Wanted: Physician to plan, construct, and operate small pioneer community health center in western North Carolina, in cooperation with school and community center. Apply **Box F,** Employment Service, A.P.H.A.

Wanted: Bacteriologist with equivalent rating of junior grade, A.B. or B.S. degree and at least 1 year's experience in public health laboratory to work in county laboratory acting in capacity of state branch laboratory. Permanent position, salary $150 per month. Apply Health Department, P. O. Box 151, Arlington, Va.

Eastern city Tuberculosis and Health Association seeks woman for health education secretary with training and experience in modern methods of organizing and conducting health education among adult groups including Negro and labor in county of about 175,000, equally divided between urban and rural. Office is located in capital of state which is a large business center. Good salary and allowance for auto expenses. State age, training, positions held, and give references. Apply **Box T,** Employment Service, A.P.H.A.

Wanted: Medical technologists for 550 bed approved California hospital. Give full particulars and state salary desired. Address N. N. Rilcoff, M.D., Medical Director, Kern General Hospital, Bakersfield, Calif.

Wanted: (Immediately) Veterinarian for Columbia Co. Dept. of Health. Salary $2,500 per year plus automobile and upkeep. Veterinarian must be licensed in New York State. Position for duration of war. Address Dr. Sue Thompson, 612 Warren St., Hudson, N. Y.

Wanted: Epidemiologist who will also serve as registrar of vital statistics. Epidemiological services involve investigations of outbreaks of disease and compilation of medical, morbidity and mortality statistics. Applicant must be qualified M.D. Salary $3,600. Apply **Box G,** Employment Service, A.P.H.A.

Wanted: (By June 1, 1945) For Columbia Co. Dept. of Health. Sanitarian. Salary $2,100 per year. Automobile and up-keep supplied by the Department. Permanent position. Address Dr. Sue Thompson, 612 Warren St., Hudson, N. Y.

Wanted: Physician to make physical examinations and supervise preëmployment medical procedures for large industrial establishment in South. Regular day hours, duties not arduous. Particularly suitable for physician retired from USPHS, Army, Navy, or private practice because of partial disability or age. Salary attractive. Write full details to **Box K,** Employment Service, A.P.H.A.

Wanted: Man of good habits, between 30 and 50 years of age, for permanent position to take charge of rodent control section of large pest control organization. Must be familiar with typhus control, including general knowledge of building construction and some practical experience in rat-proofing and rodent control. Give educational background and employment experience for past 10 years. Include small photograph. Salary to start $6,000 per year. Write **Box P,** Employment Service, A.P.H.A.

Several vacancies in the position of district and county health officers exist in Illinois. Salary range $3,900 to $4,800 per annum, plus travel allowance. Write Roland R. Cross, M.D., Director Illinois Department of Public Health, Springfield, Ill.

Wanted: Staff nurses for 250-bed municipal tuberculosis hospital. Salary $210 per month, $35 per month deducted if maintenance desired. Educational program with opportunity for postgraduate work with university credit. For full information write Superintendent of Nurses, Firland Sanatorium, Richmond Highlands, Washington.

POSITIONS WANTED

Bacteriologist-immunologist, man, age 44, 25 years' experience medical bacteriology and immunology. Steady, hard worker. Best references. Teaching and public health experience. Desires warm climate. **L-475**

Pathologist, Diplomate of American Board, Director of Laboratories and Research, Consultant Federal and State Health Agencies and Professor of Public Health. Excellent references. **L-472**

Advertisement

Opportunities Available

WANTED—(a) Pediatrician to direct division of maternal and child welfare; duties include conducting pre-natal and well child clinics; woman eligible; new program; health resort town of 100,000; Southwest. (b) Student health physician; state university, well equipped department and hospital, giving complete medical coverage to all students; Hygiene; Middle West. (c) Public health physician; duties consist of conducting public health program via boat service among natives in southeastern Alaska; boat equipped with x-ray, clinical laboratories; $5,700–$6,000. (d) Woman physician for appointment as resident physician and professor of hygiene; women's college having approximately four hundred students; duties include responsibility of medical care of students and faculty; East. (e) Assistant health officer to direct the maternal and child health department; man or woman with pediatric or public health training preferred; considerable traveling; Pacific Coast. (f) Public health physician; municipal department of health; generalized program; work includes well baby clinics, maternity centers, pre-school clinics and venereal work for the indigent; woman eligible; college town of 100,000; Middle West. (g) Woman physician to take over duties of assistant health director, student health department, co-educational college; should be qualified to succeed director should he join armed forces; young woman interested in student health career preferred. **PH5–1**

WANTED—(a) Dentist to engage in part-time work and part-time private practice; duties consist of five mornings each week working principally with school children although some work with pre-natal and venereal disease clinics; excellent opportunity for private practice; college town 40,000. (b) Public health dentist; state department of health; Middle West. (c) Dentist to become associated with student health department; co-educational college; South. **PH5–2**

WANTED—(a) Health educator or social worker to direct department of health, industrial company having two plants approximately 1,700 employees; would serve as liaison officer between officials of company and employees; interesting post-war plan; Chicago. (b) Public health nurse to direct generalized public health program residential town not far from District of Columbia; around $3,000. (c) Several staff nurses recently inaugurated public health program, Alaska; salaries start at $225 if assigned to the interior, $215 for urban appointments. (d) Public health nurse to direct visiting nurse association, preferably someone qualified to organize program; town of 10,000; Middle West. (e) Health educator for important position with tuberculosis organization; Pacific Coast. (f) School nurse; boys' academy; enrollment of 200; East. (g) Public health nurse to do tuberculosis nursing with county health department; should be experienced in tuberculosis work from sanitarium and field standpoints; city of 100,000; Southwest. (h) College nurse; young woman; college student enrollment about a thousand; town of 12,000; South. **PH5–3**

WANTED—(a) Bacteriologist; public health appointment; duties administrative including considerable research; $3,300; East. (b) Bacteriologists, clinical laboratory, technicians qualified in x-ray and laboratory work; experience in public health laboratory procedures desirable; Alaska. (c) Medical technologist to take charge of blood bank; winter resort town; Florida. **PH5–4** Medical Bureau, Burneice Larson, Director, Palmolive Building, Chicago 11, Ill.

Situations Wanted

Public health physician is available for administrative appointment; Ph.B. degree and degree of doctor of medicine eastern university; M.S. degree in Public Health Medicine; five years' experience in public health work which has been largely administrative. For further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11, Ill.

DENTIST—about to receive his honorable discharge is available; four years with the armed forces, including twenty-eight months overseas; before entering service conducted successful practice in small community; has done considerable oral surgery in private practice and in the Army; latter experience has included care of war-incurred injuries; B.S., D.D.S. from state university; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11, Ill.

BACTERIOLOGIST—is available for public health appointment; A.B., M.A., Ph.D. degrees; several years' successful teaching and research experience in general, dairy and food bacteriology; past several years, director, bacteriological department, metropolitan department of public health; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11, Ill.

HEALTH EDUCATION—B.S., M.A. degrees; four years, public health nurse and dental health consultant; past four years, director of health education county health department; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11, Ill.

PUBLIC HEALTH NURSE is available for executive position in public health nursing; A.B., M.P.H. degrees, state university; professionally trained in teaching hospital; record of successful experience in public health nursing; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago 11, Ill.

NEWS FROM THE FIELD

DENTAL SERVICE IN LOCAL HEALTH UNITS

Inspired by the interest in the work of the Subcommittee on Local Health Units, as indicated in the general acceptance of its principles by state health officers, the American Association of Public Health Dentists last summer considered the problem of dental service in local health units.

In the July, 1944, issue of its *Quarterly Bulletin*, are varied answers to a question sent to members by the Editor in accordance with the practice of submitting a question of interest to the general membership before each issue of the *Bulletin*.

The question was: What dental personnel would you suggest for

I. A public health unit of 50,000 population for
   a. An educational program.
   b. An educational and reparative program.

II. For each single or multiple health unit of 150,000 for
   a. An educational program.
   b. A reparative and educational program.

As might be expected, no unanimity of opinion was expressed by the representatives from various parts of the country. What is significant, however, is that there is a recognition of the place of dental service in a public health program, and a recognition of the service that can be rendered by dental hygienists in a dental health education program.

For an educational program in a unit of 50,000 population, the suggestions for a dental health education program range from a public health educator to one full-time dentist and three dental hygienists; for an educational and reparative program for the same size unit, suggestions vary from the use of part-time clinician dentists and contract service to four dentists and four dental hygienists. Not all those who answered the questionnaire suggest the use of dental hygienists.

For units of 150,000 the most frequent suggestion for an educational program is for one full-time dentist; however, one state dental health officer suggests one health educator and one dental health educator with dental hygienist training; and one suggests one dentist and nine dental hygienists; for an educational and reparative program the suggestions range from one full-time and two part-time dentists to 6 to 25 dentists and nine dental hygienists.

It is evident that there is less unanimity of opinion as to the ratio of public health dental personnel to population than, for example, in the fields of public health nursing, sanitation, or clerical services. This is due in part to the fact that dentists have reached no general agreement as to minimum functions of public health dental service at the local level. Should the program limit itself to dental health education? If a reparative program as well is to be done, should it include all school children, or all preschool and school, or only those of the indigent and borderline fraction of the population, or should it include all indigent and borderline population groups including adults? What part can trained dental hygienists play in an educational program? Once these questions are answered, experiments in ratios of dental personnel per unit of population can be undertaken with profit.

A SALUTE TO THE C.A.P.

The year 1945 marks the completion of a quarter-century of activity by the Committee on Administrative Practice of the A.P.H.A. The beginning of its second quarter-century finds the committee's work expanding in many new directions but with its objective unchanged—the improvement and expansion of public health services to reach all the people.

New developments in the programs carried on by seven subcommittees and numerous study groups have been reported in the *Journal* in the past year, and include:

Multiple Antigens for Active Immunization
Vol. 34, p. 452 (May), 1944.

Medical Care in a National Health Program
Vol. 34, p. 1252 (Dec.), 1944.

Next Steps in the Appraisal of Public Health Work
Vol. 35, p. 8 (Jan.), 1945.

Accident Prevention—An Essential Public Health Service
Vol. 35, p. 216 (Mar.), 1945

Announcement of a Plan for Developing a Reporting Area for Health Practices
Vol. 35, p. 287 (Mar.), 1945.

In addition to these recently reported activities, a new edition of *Health Practice Indices* will be published during this year, and *Local Health Units for the Nation* published by The Commonwealth Fund will be off the press shortly. *Indicated State Health Department Participation in the Promotion of Evaluation of Local Health Service* is shown on a map on page 537 of this issue. Last year evaluation schedules were received and graded for 178 communities in 33 states and 4 provinces of Canada. Schedules for 1944 are now being received.

Detailed studies of public health administration in selected states and shorter studies of health facilities in local areas, conducted by the field staff, continue to be one of the committee's chief functions.

E.M.I.C. AIDS 750,000

Dr. Martha M. Eliot, Associate Chief of the Children's Bureau, Washington, announced recently that about 750,000 wives and infants of service men have received care under the emergency maternity program that was authorized in 1943 by Congress. In addition to the half-million babies already served, almost 200,000 are currently on the list to receive medical, hospital, and nursing care. The cost of the service has reached nearly $70,000,000, with the federal government paying doctor and hospital bills for about one baby in six born. Dr. Eliot emphasized the fact that the program is a war measure only and that it will terminate six months after the end of the war. According to Dr. Eliot, there is evidence of the gratitude and satisfaction of the combat troops that their wives and babies are being cared for. She paid tribute to the coöperation of thousands of physicians and hospitals that have helped to make the program a success. She stated that with few exceptions the program is now operating smoothly in coöperation with state health departments. Those eligible are the wives and infants of men in the four lowest pay grades of the Army, Navy, Coast Guard, and Marine Corps and wives and infants of aviation cadets.

BORDER HEALTH CONFERENCE

The U. S.-Mexico Border Public Health Association will hold its third Border Health Conference in El Paso, Tex., and Cd. Juárez, Chih., Mexico, on May 14, 15, and 16.

INSTITUTE FOR SUPERVISORS IN PUBLIC HEALTH NURSING

The Department of Nursing Education, The University of Chicago, is offering an Institute for Supervisors in Public Health Nursing June 4 to 9 inclusive. This Institute is planned for the nurse who must meet super-

visory responsibilities for which she has not had adequate preparation. There will be no registration fee; instructional costs will be met from federal funds. Maintenance at the rate of $4 a day will be provided for those who do not live in the immediate vicinity. For further information write Nursing Education, The University of Chicago, 5733 University Avenue, Chicago 37, Ill.

SAFETY FILM AWARDS

Annually "Oscars" are awarded by the Motion Picture Committee, sponsored by the National Safety Council to producers of outstanding movies on accident prevention. One member of this committee represents the American Public Health Association. There are four classifications: Industrial, Traffic, Home, and General. The following comments of the Association's representative, H. E. Kleinschmidt, M.D., will interest health workers concerned with accident prevention and educational movies.

About 50 new films, most of them intended for non-theatrical use, were entered. Although some of them may not be rated better than mediocre, the quality of most was far better than those submitted in previous years—which is a hopeful sign. A few were so superior as to challenge the producers of health movies to greater effort. The great majority of these films deal with industrial hazards, some highly specialized and covering a wide variety of occupations from horseshoeing to airplane station maintenance. Three are instruction films for railroad workers. Films produced by the United States Navy are particularly good in workmanship. While most of the films viewed are of the training type, some of them should be valuable also as promotional films, that is, suitable for a rousing interest in safety generally. An excellent example is one designed to teach telephone linemen the art of pole climbing, which, in clever hands, might well be shown to audiences of any kind because the safety *principles* taught by this film apply equally to nearly all occupations and sports. There were only two entrants each in the "traffic" and "home" classifications—a hint to enterprising health workers that these fields are still wide open.

Eight motion pictures and two sound film strips won "Safety Oscars" for contributing most to safety in 1944.

The highest award for a theatrical motion picture in the field of occupational safety went to "Safety Sleuth"—a Pete Smith specialty produced by Metro-Goldwyn-Mayer.

Other awards in the occupational safety field:

"To Live in Darkness," produced by the U. S. Navy, won first prize as the best non-theatrical motion picture.

"The Art of Climbing," produced by the New Jersey Bell Telephone Company, won special honorable mention for the best motion picture produced for training purposes and emphasizing safety.

"Why Risk Your Life?" produced by the Great Northern Railway Company, won special honorable mention as the best safety education motion picture for railroad employees.

"Ring Down the Curtain," produced by the Michigan Bell Telephone Company, won first prize as the best sound film strip in the occupational field.

In the field of home safety, the award went to "What Price Happiness?" a motion picture produced by the Newark, N. J., Safety Council.

In the traffic safety field, the award went to "X Marks the Spot," a motion picture produced by the New Jersey Department of Motor Vehicles. This picture was praised by the committee as an "extraordinarily fine picture in every respect."

In the field of general safety, "Ice

Rescue," a motion picture produced by the Boy Scouts of America, won the award as the best non-theatrical film, while honorable mention went to "A Stitch in Time," a motion picture on farm safety produced by the Sears Roebuck Foundation.

In the same field of general safety, the award for the best sound film strip went to "Man-handled," produced by the Zurich Insurance Companies.

GENERAL FEDERATION OF WOMEN'S CLUBS HOLDS WASHINGTON INSTITUTE

During the last week of March the state health chairmen of the General Federation of Women's Clubs were invited to attend a week's institute at the National Institute of Health, Bethesda, at the invitation of Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service. Mrs. Marjorie B. Illig, of Wareham, Mass., National Health Chairman of the Federation, brought the state chairmen together for serious study of what modern public health work is and of ways in which the clubs making up the General Federation may contribute their full part. The institute was under the direction of Mayhew Derryberry, Ph.D., Chief of Field Activities in Health Education for the Public Health Service. Various staff members of the Service addressed the institute. Lucy Morgan, Ph.D., of the University of North Carolina, Helen Martikainen, M.P.H., also of the University of North Carolina, together with other state directors of health education, participated in the conference. Reginald M. Atwater, M.D., Executive Secretary of the American Public Health Association, presented an outline of the short evaluation schedule for local health service which has been planned by Mrs. Illig in coöperation with the Committee on Administrative Practice of the A.P.H.A. Dr. Atwater called the attention of the state chairmen to the forthcoming volume, *Health Units for the Nation,* shortly to be published by the Commonwealth Fund in coöperation with the Subcommittee on Local Health Units of the Association, of which Haven Emerson, M.D., of New York, N. Y., is Chairman.

DETROIT AUW-CIO HEALTH INSTITUTE

The National C.I.O. War Relief Committee through its Community Services *News Letter* describes the opening of the UAW Health Institute in Detroit which has been set up in the recently purchased former home of Edsel Ford. The Institute now includes a medical library, a large x-ray department, a laboratory and facilities for basic metabolism and electrocardiogram tests. The services offered workers through the UAW Institute include examinations for individuals, group examinations to aid in identification and prevention of industrial health hazards, health education, personal counselling for individual workers, and the organization of health and safety committees of the plants. The Institute is said to have cost $120,000 and to have an annual operating budget of $40,000. It is under the direction of Dr. Morris Raskin.

OHIO CREATES TUBERCULOSIS DIVISION

The Ohio Public Health Council recently approved the establishment of a Division of Tuberculosis in the State Department of Health. The project was recommended by the Advisory Committee on Coördination of Tuberculosis Programs after a two year study. Another recommendation, now in the process of completion, was the conversion of the Ohio State Sanatorium for Incipient Pulmonary Tuberculosis into a hospital for institutionalized mental patients with tuberculosis. The State Department of Welfare has money, plans, and specifications for this project but is awaiting the removal of wartime

restrictions. Other recommendations in the report of the two year study urged the establishment of two new state institutions for the tuberculous and covered state subsidy to local tuberculosis institutions, both of which were embodied in bills introduced in the legislature, and urged the creation of diagnostic treatment centers in the state. Another recommendation asked that x-ray equipment be provided for each of the state institutions and routine chest examinations be made of all employees and patients in such institutions.

MISSISSIPPI PUBLIC HEALTH ASSOCIATION

At the recent meeting of the Mississippi Public Health Association in Jackson, the following were chosen officers of the Association:

President-elect — Archie L. Gray, M.D., Jackson
President—Cyrus M. Shipp, M.D., Bay St. Louis
Secretary-treasurer—Hugh B. Cottrell, M.D., Jackson

COLORADO HOLDS RESTAURANT SANITATION SEMINAR

A Restaurant Sanitation Seminar was held in Denver, Colo., March 21–23, sponsored by the Colorado State Department of Health, the Denver City Health Department, and the U. S. Public Health Service, District No. 8. The seminar was conducted for state and local inspectors and sanitarians and was attended by a group representing many of the cities and counties in Colorado and Wyoming.

The program included: the history of food-borne disease outbreaks, the domestic animal as a source of food-borne disease, man as a source of food-borne disease, control of communicable disease, the legal aspects of food control, the Public Health Service restaurant sanitation program, etc.

Dr. George W. Stiles, Bacteriologist in Charge, Branch Pathological Laboratory at Denver, U. S. Bureau of Animal Industry, spoke on the domestic animal as a source of disease in man. L. L. Warden, Chief Inspector, Denver Station of the U. S. Food and Drug Administration, spoke on the legal aspects of food control. Dr. Severance Burrage, Associate Professor Emeritus, Department of Bacteriology and Public Health, University of Colorado School of Medicine, gave a talk on food handler education. Major Harold Robinson of the U. S. Public Health Service led the discussion on the other subjects. The program was illustrated by movies and slides.

Seminar discussions were based on the 1943 edition of the *Ordinance and Code Regulating Eating and Drinking Establishments* recommended by the U. S. Public Health Service. Emphasis was placed on the importance of the educational approach to sanitation problems.

WASHINGTON ACADEMY OF SCIENCES AWARD TO DR. TOPPING

Among the awards for scientific achievement for the year 1944 as made recently by the Washington Academy of Sciences of the District of Columbia, the award for achievement in the biological sciences was given to Dr. Norman H. Topping of the National Institute of Health, Bethesda, Md. "In recognition of his distinguished service in identifying eastern and western types of Rocky Mountain Spotted Fever."

ARTHUR M. JOHNSON, M.D., RETIRES AS HEALTH OFFICER OF ROCHESTER, N. Y.

A dinner in honor of Arthur M. Johnson, M.D., who has been Health Officer of Rochester, N. Y., since 1932, was given in his honor on March 31 at the time of his retirement. It was under the auspices of the Medical Society of Monroe County. Among the speakers

were Dr. Benjamin J. Slater of the Medical Society, Hon. Samuel B. Dicker, Mayor of Rochester, Dr. Alan Valentine, President of the University of Rochester, Dr. Edward S. Godfrey, Jr., State Commissioner of Health, Dr. Thomas Parran, Surgeon General, U. S. Public Health Service, and others representing the community.

DR. HEERING APPOINTED OHIO STATE DIRECTOR OF HEALTH

The appointment of Roger E. Heering, M.D., M.P.H., as Director of Health of the Ohio State Department of Health, Columbus, was announced in January by Governor Frank J. Lausche. The appointment is for a 5 year term. Dr. Heering who is a member of the regular Corps, U. S. Public Health Service, has been placed on leave in accordance with Public Law 410, Section 214. James E. Bauman, who has been Acting Director of Health, has been appointed Assistant Director.

CLEVELAND CELEBRATES PAN AMERICAN WEEK

Pan American Week, beginning April 8, was marked in Cleveland, Ohio, by an event addressed by Mayor Thomas A. Burke and Clark H. Yeager, M.D., Chief of the Medical Division, Institute of Inter-American Affairs, Washington, under the subject "Tropical Diseases—Our Problem Too." The meeting was held at the Cleveland Health Museum and was under the auspices of the Cleveland Health Council, the Academy of Medicine of Cleveland, and the Cleveland Council on Inter-American Relations.

HEALTH OFFICERS ASSOCIATION CREATED IN MICHIGAN

Dr. Clarence D. Barrett of Mason, Mich., was elected President of the recently organized Michigan Health Officers Association, which was set up "to advance public health principles and practices, to recommend standards of employment based on education, training, and experience, to make community health protection more complete and certain through study and conference with proper authorities and to strive for a good program for the retirement of health officers and staff members with pension, and to seek legislative enactment to this end." Other officers include Drs. Otto K. Engelke, Ann Arbor, Vice-President, and Vladimir K. Volk, Saginaw, Secretary-Treasurer.

PROPOSED MERGER OF HEALTH DEPARTMENTS IN WEST VIRGINIA

Merger of the Health Departments of the City of Charleston and Kanawha County has been recommended by Dr. Elias W. Langs, U. S. Public Health Service (R), who conducted a survey and made an exhaustive study of the matter early in the winter in coöperation with Dr. John E. Offner, Weston, W. Va., State Health Commissioner. The survey, which followed the recommendation of the State Medical Association's fact finding and planning committees that all city health departments be merged with the health department of the county in which the unit is located, was made with the full consent of city and county officials. In his report, Dr. Langs recommended that within two years after the merger, all affiliated health agencies, including the entire school health service, be consolidated with the unit, which would be under the direction of an experienced health officer. Administration would be under the supervision of a nonpartisan Board of Health.

SCHOOL HEALTH SURVEY IN KANSAS

The Kansas State Board of Health is sponsoring a state-wide school health study in coöperation with the State Department of Public Instruction and other state agencies interested in child

health, education, and welfare. Ground work was laid at a series of recent meetings at which Clair E. Turner, Dr.P.H., temporarily on leave from the Office of the Coordinator of Inter-American Affairs, Washington, D. C., as Health Education Officer, was in attendance.

CALIFORNIA HEALTH BOARD OBSERVES SEVENTY-FIFTH ANNIVERSARY

On April 15, the seventy-fifth anniversary of the organization of the California State Department of Public Health was observed. The department is the second to be established in the United States, the first being the Massachusetts Department of Public Health. According to *California's Health*, the official bulletin of the State Health Department, the transcontinental railroad was completed only a few months before the creation of the board, and the enactment of progressive legislation to establish the California State Board of Health at this early period is a noteworthy event.

PROPOSED PROGRAM TO COÖRDINATE HEALTH ACTIVITIES

The health panel of the Agricultural and Industrial Development Board of Georgia has submitted a program to coordinate health activities in the state and improve the efficiency of operation. The plan has the approval of the State Board of Health, the Georgia Hospital Association, and the Medical Association of Georgia, and it is hoped that the present legislature will endorse it. It has been recommended that the state be divided into nine districts, each to have a complete medical staff composed of administrator, epidemiologist, venereal disease control officer, tuberculosis control officer, and maternal and child hygiene control officer, to be solely responsible for the complete public health program in the district. In addition there would be one sanitary engineer in each office. The recommendations carry certain provisions for the availability of nurses. Under the plan each County Board of Health would operate under its present powers. The health panel also suggests that the act of 1941, which gave each county the right to create a hospital authority, be made operative in every county, the hospital authority to be responsible for the construction and maintenance of hospitals, clinics and health centers. Certain recommendations have been made for the financial handling of the program, which has been described as definitely the development program for the post-war period in Georgia.

GOVERNOR OUTLINES HEALTH PROGRAM FOR INDIANA

Recently Governor Gates of Indiana outlined the legislative program of his administration for general expansion of the state's health service facilities, according to the Indianapolis *Times*. Among his recommendations was the reorganization of the State Board of Health, increasing its membership from four to seven to include three physicians, one dentist, one sanitary engineer, one pharmacist, and one woman who has "demonstrated interest in public health." The bill carrying this recommendation, now passed and signed by the Governor, includes a nurse and a veterinarian as members of the board, bringing the total to nine.

DR. COHN RECEIVES PASSANO FOUNDATION AWARD

Dr. Edwin J. Cohn, Professor of Biochemistry at the Harvard Medical School, Boston, was awarded the prize of the Passano Foundation at a ceremony in Baltimore on May 16. The Foundation, which was established in 1944 by the Williams & Wilkins Company of Baltimore, "proposes to aid in any way possible the advancement of medical research, especially research that bears promise of clinical applica-

tion." The award is $5,000 in cash. The medical members of the committee included Dr. Emil Novak, Dr. Nicholson J. Eastman, both of Johns Hopkins University, and Dr. George W. Corner of the Carnegie Institution of Washington.

Dr. Cohn is known for his work on the fractionation of blood. Beginning in 1919 with a study of blood and blood proteins, Dr. Cohn's research has progressed until it has yielded a group of five principal fractions of blood plasma which hold promise of usefulness in medical science.

COL. IRA V. HISCOCK RECEIVES LEGION OF MERIT

Colonel Ira V. Hiscock, Officer in Charge of the Public Health Section, Economics and Relief Branch of the Civil Affairs Division, was presented the Legion of Merit on April 9, it has been announced by the War Department. The citation, in part, reads as follows:

"For exceptionally meritorious conduct in the performance of outstanding services from April, 1943, to February, 1945. As Officer in Charge of the Public Health Section, Economics and Relief Branch of the Civil Affairs Division, Colonel Hiscock with rare foresight and ability supervised all matters relating to health services, hospitals, medical services and sanitation pertaining to the civilian populations in liberated or occupied countries, and acted as liaison between the Office of the Surgeon General, and Civil Affairs Schools, and the School of Military Government at Charlottesville, Virginia.

"His advice to the Civil Affairs Division on all medical matters within its jurisdiction and to the G-5 Division of the Theaters of Operation and tactical command headquarters, together with the prompt action taken by him, prevented the serious consequences which might have resulted from the dangers of disease to which our troops were exposed."

Colonel Hiscock was placed upon inactive duty April 12 to become Chairman of the Department of Public Health at Yale University. He was Professor of Public Health in the School of Medicine at Yale prior to entering service.

NATIONAL ADVISORY CANCER COUNCIL PLANS EDUCATIONAL PROGRAM

Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service and Chairman of the National Advisory Cancer Council, has reported that the need for immediate establishment of pilot courses in cancer for third and fourth year medical students has been recognized by the Council at its recent meeting. Definite emphasis according to Dr. Parran should be placed on early diagnosis of cancer which is now the second cause of death in the country. It was pointed out that the general practitioner is the first line of defense in cancer control and that courses in medical schools should be slanted toward making graduate medical students cancer conscious. It was agreed that long-range post-war planning of cancer research programs is necessary and that support for the program should be planned for from five to ten years instead of one year at a time.

The Council announced the approval of three grants-in-aid for cancer research, each of $5,000 to Washington University School of Medicine, St. Louis, Mo., Bernard Free Skin and Cancer Hospital, St. Louis, Mo., and an additional grant for the Bernard Hospital for two years for the measurement of carcinogenicity of residual oils. Dr. R. R. Spencer is chief of the National Cancer Institute.

PERSONALS

Central States

ROLAND R. CROSS, M.D.,† of Springfield, Ill., Director of the Illinois Department of Public Health, has been named by Governor Green as Chairman of an Advisory Committee on Medical Services to serve with the

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Governor's Committee on Veterans' Rehabilitation and Employment.

CLAY G. HUFF, Sc.D., Professor of Parasitology at the University of Chicago, has accepted an invitation from the Institute of Public Health and Tropical Diseases of Mexico City to visit that institution as guest investigator. Dr. Huff's trip was under the auspices of the U. S. Department of State.

WILLIAM M. LEFEVRE, M.D., has been appointed a member of the Muskegon Board of Health in Michigan to succeed the late DR. SAMUEL A. JACKSON.

CHARLES A. SILER, M.D., a practising physician in Oak Park, Ill., since 1929 and formerly a medical missionary in China, has been appointed Health Commissioner of Oak Park, effective February 15. He succeeds DR. GILBERT P. POND,† who resigned to accept a commission in the U. S. Navy.

Eastern States

GEORGE A. NEVITT, D.D.S., M.S.P.H., Dental Surgeon (R), USPHS, who has served for several years in District Office 2, Sub Treasury Building, N. Y., has been assigned by the Surgeon General as Dental Consultant to UNRRA with headquarters in London. Dr. Nevitt will replace DR. FRANK C. CADY of the Public Health Service.

NATALE COLOSI, PH.D.,* of New York City, has been appointed a member of the Interstate Sanitation Commission of New York, New Jersey, and Connecticut as recently announced by Governor Dewey. Dr. Colosi is Professor of Bacteriology and Public Health at Wagner College and Director of the Parkway Hospital.

GILBERT DALLDORF, M.D., who since 1929 has been Director of Laboratories of the Grasslands Hospital, Valhalla, N. Y., has been appointed Director of the Division of Laboratories and Research in the New York State Department of Health, Albany, succeeding AUGUSTUS B. WADSWORTH, M.D.,* recently retired. Dr. Dalldorf, who is a native of Iowa, is a graduate in medicine of New York University.

BION R. EAST, DDS,* has been appointed Professor of Dentistry and Dean of the School of Dental and Oral Surgery at Columbia University. Dr. East has been assistant professor at the DeLamar Institute of Public Health, Columbia University, since 1940. Dr. East was a Lieutenant Colonel in the Dental Corps of the A.E.F. and has served with the U. S. Public Health Hospital No. 9 in Detroit.

HORTENSE HILBERT, R.N., New York, N. Y., has been appointed Director of the Bureau of Nursing of the New York City Department of Health, effective April 1. Miss Hilbert for three years has served as Associate Director of the National Organization for Public Health Nursing, New York, preceding which she was a regional public health nursing consultant of the U. S. Children's Bureau, Washington. Miss Hilbert's appointment fills a vacancy that has existed since August, 1943, by the retirement of Amy Grant, R.N.

ALBERT D. KAISER, M.D.,* of Rochester, N. Y., has retired from private practice of pediatrics to become City Health Officer of Rochester, N. Y., succeeding DR. A. M. JOHNSON * who has retired after serving since 1932. Dr. Kaiser, who is a graduate in medicine of the Harvard Medical School, will develop the work of the City Health Department in connection with a new Department of Child Hygiene at the University of Rochester.

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ANTHONY J. LANZA, M.D.,* who recently retired from the Army with the rank of Colonel in the Medical Corps, has received the award of the Legion of Merit for his share in the development of the health program of the Army for civilian workers while he was Chief of the Occupational Hygiene Branch of the Office of the Surgeon General.

MARION F. LOEW, M.D.,† who since 1936 has been Assistant Director of the Division of Maternity, Infancy and Child Hygiene, New York State Department of Health, Albany, has resigned to accept a position at the Samuel S. Fels Research Institute, Antioch College, Yellow Springs, Ohio.

Southern States

FRANCIS H. COLE, M.D., Director of the Tuberculosis Control Division of the Memphis and Shelby County Health Department, Tennessee, has been given a two year leave of absence. He will go to New York City for a postgraduate training course in thoracic surgery at Bellevue Hospital.

SIGMA V. LEWIS, M.D.,† has been appointed Director of the Burke-Caldwell District Health Department with offices in Lenoir, N. C.

WILBUR A. SAWYER, M.D.,* Director Emeritus of the International Health Division, Rockefeller Foundation and currently Medical Director, UNRRA, Washington, received recently the degree of Doctor of Laws at the Charter Day Exercises, University of California, Berkeley.

Western States

PERCY F. GUY, M.D.,† Seattle, Wash., who has served as Chief of the Maternal and Child Hygiene Division, Washington State Department of Health, has resigned to enter practice in Seattle, Wash., as of April 1.

WAYNE P. MCKEE, M.D., has been named Health Officer of Ferndale in Humboldt County, Calif., succeeding DR. HERBERT C. JAMES.

ALBERT F. ZIPF, M.D.,† Health Officer of Sacramento County, Calif., has taken over the activities of the Health Officer of Sacramento, DR. HERBERT F. TRUE,* who retired because of ill health.

Foreign

TOMAS DE VILLAFANE, M.D.,† and ANDRES P. H. DEGOY, M.D.,† both of Cordoba, Argentina, South America, have been touring the United States with special interest in tuberculosis and in brucellosis. They returned to Argentina in March.

SIR JOHN BOYD ORR,* according to *Science*, has tendered his resignation from the directorship of the Rowett Research Institute, Bucksburn, Aberdeenshire, Scotland, after holding that post since its foundation.

Deaths

CHARLES ROBERT BLAKE, M.D.,† for 34 years Health Officer of Richmond, Calif., and member of the honorary staff of the Richmond Hospital, died December 27, aged 76.

JESS W. HAIR, Director, Division of Public Health Education with the Louisiana State Department of Health since September, 1942, died suddenly recently.

EMIL ARNOLD SCHLAGETER, M.D., who was associated with the Chicago Health Department as a diagnostician and Supervising Health Officer for many years, died January 18, aged 61.

WILLIAM K. SKILLING, M.D., of Baltimore, Md., Director, Bureau of Child Hygiene, City Health Department, died November 20, aged 59.

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